

THE
MEDICAL MUSEUM:

OR,
A REPOSITORY
OF

Cases, Experiments, Researches, and Discoveries,

Collected at HOME and ABROAD.

IN
ANATOMY, || BOTANY,
MEDICINE, || CHEMISTRY,
PHARMACY, || SURGERY,
PHYSIOLOGY, &c.

A Deo est omnis Medela.

ECCLUS. xxxviii. 2.

By GENTLEMEN of the Faculty.

VOL. II.

L O N D O N :

Printed by W. RICHARDSON and S. CLARK;

AND SOLD BY

W. BRISTOW, at the West End of St. Paul's Cathedral.

M DCC LXIII.



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THE
MEDICAL MUSEUM.

N^o I.

Observations upon the Effects of Electricity, applied to a Tetanus, or Muscular Rigidity, of Four Months Continuance. In a Letter to the Royal Society. By William Watson, M. D. F. R. S.

[A few copies of the following History having been printed for private distribution, and one of those having fallen into our hands, we hope to have the Author's pardon for rendering it more public by the means of our Museum.]

GENTLEMEN,



EVER since your establishment, the communicating the history of uncommon diseases has seldom failed of a favourable reception by you, and has been frequently thought to merit a place in your journals and register-books. This has emboldened me to lay before you the following history:

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CATHERINE FIELD, a girl in the Foundling Hospital, aged about seven years, and otherwise a healthy child, having been disordered a few days with what were considered as complaints arising from worms, was observed, on Thursday, July the eighth, 1762, to open her mouth with great difficulty. This particular circumstance increased so much, that by the Sunday following, when I first saw her, her teeth were so much confined, it was with difficulty that even liquids could be admitted into her mouth. She had two days before parted with two worms, and had had several very offensive stools. Her breath was now, and had been for some days, very fetid.

THOUGH her jaw was locked very close, she was without pain; even in the temporal and masseter muscles, whose office is to bring the under-jaw to the upper; and which, in this instance, were tense, hard, and spasmodically affected. She was feverish, her pulse was quick, and her flesh hot; and she had had but very little sleep.

ON Monday, July 12, I visited this poor girl in consultation with my learned and ingenious friend and colleague Dr. Morton. We found she had had a restless night; her fever was high, and it was infinitely difficult to introduce any thing between her teeth. As there had been no wound, no eruption repelled, we were of opinion, from her offensive breath and other indications, that the spasm of her jaw was symptomatic, either of worms or foul bowels.

WHATEVER was admitted into her mouth was swallowed without difficulty; neither in this state of the disease was her breathing at all affected. The regimen we put this patient under, for this formidable complaint, will be mentioned hereafter.

FOR near three weeks the disorder confined itself to the jaw, during which time she was constantly feverish. At times indeed her fever ran very high, and her pulse beat 130 strokes

strokes in a minute. At other times it beat only about 100; but it never for these three weeks was slower than that number.

NOTWITHSTANDING our best endeavours, the disease not only continued, but the rigidity communicated itself to the muscles of her neck, so that she could not move her head in the least: and from pains shooting down her back, we had reason to apprehend, and which indeed did soon after happen, that the muscles of her back would soon likewise be rigid.

AFTER the back was affected, the disease extended itself very fast; so that by the end of September, almost all the muscles of her body were rigid and motionless. To be somewhat more particular; the rigidity from the temporal and masseter muscles had extended itself to the cheeks, to the muscles of the neck, breast, abdominal muscles, all those of the back, the right arm, the hips, thighs, legs, and feet. Nor were they by any force, that could be exerted with safety, to be extended. By the rigidity and contraction of the large and long muscles of the back, the os sacrum and hips were pulled towards the shoulders; so that the spine formed a very considerable arch. By the superior strength of the flexor muscles of the thighs to that of the extensors, the legs were pulled up almost to the thighs.

OF all her limbs, the left arm only preserved any motion. Of this the joint of the shoulder was rigid, that of the elbow extremely impaired; but the wrist, hand, and fingers, were reasonably pliant. The various muscles subservient to the motion of the eyes, eyelids, lips, and tongue; as well as those, internal ones at least, which assist in performing the offices of respiration and deglutition, did not seem in the least to partake of the rigidity.

FROM the end of September to the middle of November, the disease, as though it had exerted all its power, was at a

stand. The feverish heats had left her, and her pulse beat generally between eighty and ninety strokes in a minute. But during this interval the poor patient was seized many times, both in the night and in the day, with violent convulsions in those muscles of the eyes, face, and right arm, which had any mobility left. These were so severe, that, in her weak and wretched state, her attendants imagined every attack would put an end to her distresses.

IN this state, partly from the severity of the disease, and partly from the very small quantity of food which could be given to her, and which was only through a small opening made by extracting two of her teeth, and without which she must inevitably have been starved, she was emaciated in a most extraordinary manner. Her belly was contracted, and pulled inwards towards the spine. Her whole body, to the touch, felt hard and dry, and much more like that of a dead animal than a living one. This, added to the very great distortion of her back and lower limbs, heightened the disagreeable spectacle, and called to my mind that admirable passage of * Aretæus, who, when treating of and contemplating this disease, calls it "*inhumana calamitas, injucundus aspectus, triste intuenti spectaculum, et malum insanabile.*" And he subjoins, that "their distortions are such, that they cannot be known by their most intimate friends;" which in the case before us was most strictly true.

DURING the continuance of this disorder, which had lasted now more than four months, nothing had been omitted that either Dr. Morton or myself could suggest for her relief. While worms or foul bowels could be suspected to have occasioned this illness, as her stools were at first very offensive, and she had voided two worms, vermifuges of the most celebrated

* Cap. VI. Ἐξάνθρωπος ἡ συμφορὴ καὶ ἀλγεῖς μὲν ἡ ὄψις, ὀδυνηὴ δὲ καὶ τῷ ὁρεῶν. ἴσθι, ἀνία ἔσται δὲ τὸ θάνατον.

kind,

kind, linseed oil both by the mouth and by clysters, and such other medicines as tend both to carry off or destroy the worms, and cleanse the bowels, were assiduously administered. But no relief arising from these, bleeding with leeches at the temples, when her fever ran high, blisters behind the ears, round the neck, upon the head, and in various parts of her body, were from time to time applied, as the disorder seemed to indicate. Nor during this time were antispasmodic remedies of various kinds omitted, and that in very liberal doses. Among these, as in several cases of locked jaws, related by authors of undoubted credit, opiates had been found to have been attended with great success, Tinctura Thebaica was copiously given. So that, between the 12th of July and the end of the month, more than nine hundred drops of that tincture were taken: A large quantity for so young a person! This we sometimes thought had a good effect, as the jaw was at times somewhat loosened; but this advantage was temporary, and the stricture soon returned as severe as before.

THOUGH this medicine, given in large doses, did not affect her head, but only gave her quiet nights, yet it was occasionally obliged to be suspended; as her pulse was at times much sunk, and her sweats cold and clammy. Volatile liniments were liberally used to the rigid parts, and warm bathing was continued for many weeks, with much friction, while in the warm water.

AFTER warm bathing had been so long tried without sensibly good effect, cold bathing, recommended by Hippocrates* for the cure of this disease, was directed; and she was dipped several times, without being apparently the better or worse for it.

FROM the end of September, as what had been done hitherto had not been able to prevent the rigidity extending it-

* Περὶ νόσων, Lib. III.

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self, we desisted from attempting to relieve her by medicine, and determined to nourish and support her; and wait to observe, though it was scarce to be expected, whether nature unassisted would point out any crisis for her relief. This attention was continued to the middle of November, without any other alteration than that her convulsions increased in their force; and every day, by those who were about her, was expected to be the last; and which was an event, as the prospect was so unpromising, much to be wished for. Dreadful however as her situation was, she was still alive: we were desirous therefore of omitting nothing, that in the least might be expected to relieve her.

I HAD heretofore many times observed, that in paralytic limbs, the muscles of which had for a considerable time ceased to be subservient to the will of the patient, I had been able, by the means of electricity, to make any muscle I thought proper contract itself, and act as a muscle, without the patient's being able to controul it. I had seen in one instance the good effects of electricity, in restoring to the hands and arms of a paralytic almost their accustomed strength, and voluntary motion; but these good effects, the greatest part of them at least, were only temporary, and the patient relapsed. But I had never seen or known the effects of electricity in the contrary affection, viz. rigidity of muscles. I was very desirous therefore of trying its effects in this instance, and of shaking the rigid muscles by electricity; especially as I could have it done with very little pain, and no danger to the patient.

I JUST now mentioned, that I was able in paralytic persons to make any particular muscle at my will ~~exert its action~~. This was to be effected by simple electrifying only; but by modifying and altering the apparatus of the charged vial, I was able to do much more. It is now seventeen years since, that I discovered, and communicated it to you at that time, that by means of the electric circuit I could cause the electricity to

4

pervade

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pervade any muscle, any number of muscles, or whatever part of the body I pleased, without affecting the rest with that unpleasant sensation. Many experiments, relating to this matter, and which I laid before you, were printed in the forty-fourth volume of the Philosophical Transactions*.

BUT to return to our patient: we ordered her to be electrified about the middle of November. This was done every day, or every other day for about twenty minutes, by simply electrifying the muscles subservient to the motion of the lower jaw, her neck, and her arms. This at first was very difficult to be achieved; as she was not capable of being placed in a chair to be electrified by herself, and as an assistant could scarce hold her on account of her being so greatly distorted. It with difficulty, however, was done.

AFTER about a fortnight, the convulsions left her, and her sleeps were longer and more quiet; but the rigidity continued the same. After this, such parts of her body as were thought expedient, were made part of the electric circuit, and were shook by the explosion of the charged vial. These applications were at first more particularly made to the temporal and masseter muscles (the parts first affected) and to the muscles of the neck and arms; afterwards to those of her back, hips, thighs, and legs. Care was taken to moderate the shocks, in a manner not to be too severe; and shew as electrified every second and sometimes every third day.

THE fits as I just now mentioned, and which were of the epileptic kind, left her in about a fortnight from her being first electrified, and have never since returned, even in the slightest degree. In about a fortnight more her jaw was looser, and the muscles of her neck and arms had a large share of motion: and it was very observable, that as her muscles increased in

* Pag. 718, & seq.

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their power of motion, they increased in their size, and the patient in her strength. By the end of January, not to be too tedious in my narration, by continuing the electricity, every muscle in her body was loose, and subservient to her will; and she could not only stand upright, but walk, and now can even run like other children of her age. With her strength, she has so far recovered her flesh and colour, that her present appearance is that of a reasonably healthy child; and her breath has quite lost its late offensive smell. The only parts of her body not quite so loose as the rest, are the temporal and masseter muscles, which were the parts first affected by the disease. This prevents her opening her mouth quite so wide as she formerly could; but this hindrance is so little, as not at present to be taken notice of, unless hinted at beforehand. She now goes to school, lives at large, and goes out every day when the weather is seasonable; but the electrifying is still continued, though not so constantly and regularly as before. This I propose should be continued, until the return of warm weather. In the last week this child was presented to the committee of the Foundling Hospital, where several of the governors, who were apprised of her case, expressed their amazement at her so unexpected recovery.

It is here to be observed, that, except the muscles subservient to the motion of her jaw, none so long continued their rigidity as those of the back, denominated "*longissimi dorsi*" by anatomists. These, when almost all the other muscles of the body were loose, remained tense and hard; and, by pulling the loins up towards the shoulders, continued the arch of the spine abovementioned. As the patient was so much emaciated, these muscles might be traced, on each side of the spine, from their origin to their insertion; and for a considerable time after she was in other respects recovering, these felt hard like twisted cords. At length, however, by directing the electricity through them, and the parts near them, in a very liberal quantity,

quantity, these likewise gave way, and are now as loose as any other muscles of her body.

IN proportion as a matter is extraordinary, the proofs to support its reality should be extraordinary. That excellent maxim, "Nil temere credere," should never be lost sight of in our inquiries; otherwise novelty and the love of the marvellous will be apt to mislead us. On the other hand, the indulgence of an extravagant pyrrhonism may prove equally detrimental in every endeavour to extend the bounds of science. It may prevent the giving due weight to matters of real information, and hinder their being made useful. For my own part, I should think it an indignity offered to the Royal Society, to lay before you any extraordinary phenomenon, which is supported only by a slight degree of evidence. On the contrary, when a number of concurrent circumstances tend to establish a fact, we ought not in a certain degree to refuse our assent to it, though somewhat out of the common course. Thus in the case before us; when an unusual disease of several months continuance, and when the patient was supposed to be reduced to the last extremity; when medicines and applications of every kind, celebrated by the ablest writers and practitioners both ancient and modern, had been tried with little or no effect, at least with regard to the rigidity; when during a course of electrifying no medicines or applications of any kind were made use of; when likewise, during this course, the patient voided no worms, had no purgings, eruptions on the skin, or kindly impostumations, which might have been considered as critical discharges, and to have brought about the cure; when, I say, none of these things have happened, and the patient, by electrifying only, and that at a very severe season of the year, has been restored to perfect health, I cannot refuse my assent in believing it effected by the power of electricity. That so active a principle, when properly directed to the diseased parts, should have important effects, no one can doubt who has been in the least conversant with it. Though

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at the same time I confess, well apprised of the salutary effects of warm weather in restoring a more perfect motion to torpid limbs, that had the electrifying been begun in March, and continued to the end of May, though attended with the same success as in the present instance, I could not have suppressed my doubts of the warm weather greatly contributing thereto. But as this was done during the depth of winter, and that a severely cold one, no scruples, in my mind at least, can arise upon this head. I take the liberty however to lay the whole evidence before you, that every one may make from it such deductions as he thinks proper.

PERHAPS indeed some may be of opinion, that even the cold weather contributed to cure this disorder. But it is well well known, that warmth relaxes the animal fibres, and that cold constricts and braces them. In the case before us, the muscles, composed of minute fibres, were as rigid and tense as they well could be, even in a diseased and obstructed state. If cold therefore contributed any thing, it was to make this case worse. And this is conformable to the opinion of Aretæus*, who, among the causes of this disease, reckons intense cold; and says, "that for this reason the winter of all the seasons " is most productive of this disease." He subjoins, "that " women are more subject thereto than men, on account of " the coldness of their constitution." Celsus † likewise expressly asserts, that cold sometimes is the cause of it, and in another part of his excellent work says, "that the greatest " caution should be used to defend the patient from cold; " and that therefore the fire in his room should be constant." He moreover recommends warm bathing both in water and oil, as conducive to the cure of this disease. To these may be added the sentiments of Cælius ‡ Aurelianus, who confi-

* Aretæus, lib. I. cap. VI.

† Celsus, lib. II. cap. I. Frigus modo nervorum distentionem, modo rigorem infert: illud Σπασμὸς, hoc Τένανος Græce nominatur.

‡ De Morbis Acutis, lib. III. cap. VI. VIII.

ders that cold is frequently the cause of this disease. He recommends various kinds of warm external applications; such as warm bathing, rubbing the affected parts with warm oil, the application of warm cataplasms, bags of heated bran, or linseed. With Celsus, this author recommends, that attention be given to the warmth of the patient's chamber. How far therefore, for the reasons and authorities before-mentioned, cold weather could probably assist in the cure of the case before us, need not in my opinion be insisted upon.

AND now, gentlemen, permit me to make a few observations upon the disease itself, which, at least in a degree of the case before you, is a very rare one in temperate climates. In warmer countries, and especially between the tropics, it is too often seen. It was well known to the ancients. Hippocrates* calls it Τέτανος, and says, that those who have it severely, die on the fourth day; if they survive that day, they recover. He makes farther mention of it in other parts of his works†; more particularly in his book Περὶ Νούσων, where he describes both the Tetanos and Opisthotonos. In this part of his work, instead of the fourth, he mentions once, and repeats it, that if they live beyond the fourteenth day, they recover. Left it should appear, that the father of the medical art seems to contradict himself, it may not be improper to remark, that when he says, that the Tetanos is mortal in a very few days, he most generally means those which are symptomatic, and are attendant upon wounds, luxations, and bruises; such as the three instances mentioned in his epidemics. Those affected with this disease, mentioned by Hippocrates in his book Περὶ Κρίσεων, are expressly said to arise from wounds. These were for mortal. But where these diseases took their rise from other causes, they were less violent, continued longer, and the

* Aphorism, lib. v. sect. vi.

† Vide lib. Περὶ κρίσεων—

Περὶ τῶν ἐν ὄσσι παθῶν, & alibi.

expectation of recovery was greater. In his book therefore, *Περὶ τῶν ἐν ὄσσι παθῶν*, when treating of the opisthotonos, attendant upon a fever, inflammation of the throat, or other internal disorders, he says, that if they live beyond the fortieth day, they recover.

ARETÆUS*, under the same appellation with Hippocrates, has given us an excellent history and remarks upon this disease, as well as upon the opisthotonos and emprosthotonos, which are nearly related to it; or to speak more properly, the same disease affecting different muscles, and throwing the body into different kinds of distortion. Celsus† has mentioned and described this disease, to which no name was assigned by his countrymen, and has called it "Quidam nervorum rigor." Though this excellent author reckons it among the diseases of the neck, the parts first affected by it are the muscles subservient to the motions of the lower jaw, from which it is usually, if the disease continues, propagated to those of the neck. Cælius‡ Aurelianus has, as it is supposed, from Soranus, described it, and handed down to us such methods of cure, as had been found in his time most successful.

PLINY§ mentions the tetanus in many parts of his Natural History. He forbids the use of wine to those who labour either under this disease, or the opisthotonus. He recommends in different parts of his work, as internal remedies, castor, hellebore ||, the ashes of the fig-tree, pediculi marini, and

* Morb. Acut. lib. i. cap. vi.

† Lib. iv. cap. iii.

‡ Morb. Acut. lib. iii. cap. vi.

§ Plinii Hist. Nat. lib. xvi. xxxi, xxxii.

|| Ibid. lib. xxv. The hellebore made use of, was to be prepared in (at that time) a newly-discovered manner, which was to prevent the effects of its acrimony. This was, by putting the hellebore between radishes split, and then tied together, including the hellebore; which, by being macerated in this manner for about seven hours, was supposed to become more mild in its operation.

pepper. He advises warm baths, with the nitre of the ancients dissolved in them; and directs the patients at other times to be rubbed with the coagulum found in the stomach of a calf, or with the juice of peucedanum, or hogs-fennel. This, it is to be presumed, was the most general method of treating these diseases, in the age wherein this author wrote.

THIS disease is frequent in Greece, Italy, and in the warmer parts of Europe, where its effects are severely felt. Bontius*, who resided long in the East Indies, has briefly described it; which, though he says it is rare in Holland, may be reckoned endemic in India. He seems not to have known what had been written by his predecessors upon this subject. He takes notice, that sometimes men seized with it became disto citius rigid as statues.

AN admirable account of this disease was a few years since communicated to the public by Dr. Lionel † Chalmers of South Carolina, where it is very frequent, especially among the negroes. And I am informed by a learned gentleman of undoubted credit, that in our military operations between the tropics in America, great numbers of our people, particularly of those who were wounded, died with locked jaws.

IN England we generally to this disease give the name of the locked jaw; but that, let it arise from what cause it may, is only one symptom of it. If it continues, as in the case before you, the occasion of this paper, it propagates its rigidity to the neck, breast, and then to other parts of the body.

It is seldom seen here that the tetanus, is an original disease. It is generally symptomatic, and the consequence of some other disorder. It frequently is subsequent to wounds and bruises of the nerves and tendons. I have known it arise to a certain de-

* Bontii Meth. Medendi, cap. ii. De Spasmo.

† Medical Observations, vol. i. pag. 87.

gree from the sudden checking of an eruption upon the skin. I knew a temporary opisthotonus occasioned by the too sudden loss of a large quantity of blood. To these permit me to add, that the tetanus of the temporal and masseter muscles constantly attended those whom I have known to have been accidentally poisoned by taking the *oenanthe aquatica succo viroso crocante* of Lobel; and of which, two communications of mine occur in the Philosophical Transactions.

I MUST here remark, that in the true tetanus, the arms, when rigid, are straight, and extended along the trunk; the legs and thighs are likewise straight; but the case before you, in some degree, partook of the opisthotonus, especially in the lower parts; as the spine was remarkably curved, and as the legs were pulled up towards the thighs.

THE tetanus I now lay before you, was an original disease; as there had been no wound, no eruption suppressed, nor other cause, which, we imagine, could occasion it. A case of a similar kind, as an original disease, occurs in Dr. * Storck's *Biennium Medicum*. And the emprosthotonus, mentioned by the ingenious Dr. Macaulay, in the second volume of the *Medical Observations*, lately published, seems to have been likewise an original disease, and not a symptom of any other. As the case I now communicate is a very singular one, at least in Great Britain, and the treatment of it not less singular, though attended with all possible success, I had reason to hope, that you would not be displeased to have it laid before you, in a manner somewhat circumstantial. I am firmly of opinion, if the epilepsy had left this patient, and life had continued, that she would have remained a most miserably helpless object, and as confirmed a cripple as can be imagined.

At present the patient is well; but if, contrary to expectation, she should relapse, or any thing should occur in her case

* Part I. page 6.

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worthy your notice, I shall not fail to acquaint you with it;
and am, with the utmost regard,

Gentlemen,

Your most obedient humble Servant,

W. WATSON.

Lincoln's Inn Fields, 9 Feb. 1763.

P. S. The patient continues well, her jaw is as loose as ever.

The electrifying has been discontinued above a month; and
she is in every respect perfectly recovered.

27 March 1763.

Nº II.

The Case of John Black. Communicated to the Authors of the Medical Museum. By Thomas Antrobus, Surgeon to the Liverpool Infirmary.

JOHN BLACK, of Pooltown in Lancashire, a weaver by trade, of an healthy constitution, and about twenty-three years of age, was admitted a patient into the Liverpool Infirmary, under my care, Sept. 9th. 1762, for a very large swelling on the inside of the right leg, which nearly equalled the size of a man's head.

THIS tumour had been nine years growing, but never attended with any pain, nor was it any ways troublesome but in walking; for it was now become so large as to make him straddle much, and to strike it often against the other leg. It was not in the least discoloured, but the veins upon the skin were preternaturally distended. It extended from about the middle of the internal gastrocnemius muscle, to the middle of the tendo Achillis, to which it seemed firmly to adhere. The upper part felt like cartilage, but as it descended, seemed more soft and fleshy. I could not perceive any fluctuation of matter,

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ter, but judged if there was any, it lay very deep. It had distended the skin to such a degree, that in one particular part, on the outside of the leg, there seemed a cavity which I thought contained matter.

How to judge from these external appearances, with any degree of certainty, what was contained, I could not; sometimes I thought it might be a tumour of the aneurismal kind, though no pulsation was to be felt; at other times I apprehended it to be one of the incised sort of tumors, from the seeming fluctuation and thinness of the skin on the opposite side of the leg.

HOWEVER, being determined upon the operation, previous to it, I informed my patient of the uncertainty of the event, and the danger and difficulty which might ensue; and if I found it either impracticable or impossible to extirpate the whole, he must submit to the loss of his leg.

LEAVING himself wholly to my care, I performed the operation on the 20th October, 1762. First I made an incision through the skin, the whole length of the tumour; afterwards I dissected it to the basis, and then I cut deep through the body of the tumour, into a cavity between the tibia and internal gastrocnemius muscle, which I do imagine was formed by the great distension of the parts; but found not any extravasated fluid contained. Into this cavity I introduced my finger, but nothing intervened between it and the skin on the outside of the leg, but a very soft spongy flesh, directly opposite to that place, where, before the operation, I thought matter was contained.

FINDING the whole substance to be partly cartilaginous, and partly sarcomatous, and so much interwoven between the interstices of the muscles, and so adherent to the tendo Achillis, and to many others, I prudently desisted from proceeding any further, as I found it was impossible to cut the whole away.

HAVING the instruments and apparatus ready for amputation, I immediately cut off the leg below the knee, sufficiently high above the tumour, as I apprehended; for no part of it appeared externally in the place where I made my first incision; but after the bones were sawn through, I soon found I had cut below a part of the disease, for there appeared a truly cartilaginous substance above the amputated part, on the inside of the tibia, which almost equalled it in size, and which, before the operation, could no-ways be discerned, as it ran underneath the upper part of the gastrocnemius internus muscle, and towards the head of the tibia; but did not extend into the joint, for that before the operation had its proper motions of flexion and extension.

IN taking up the arteries I found one to run between the tibia and this cartilage, and in attempting to tie it, I endeavoured to pass the point of the needle a little into it, that I might the more easily secure it by the ligature, but it was so hard as to frustrate my attempt.

THE stump was dressed in the usual time after such an operation, and every appearance, for some dressings, promised favourably; but as digestion increased, the discharge was thin, the quantity too great, and a disagreeable fungus arose almost round the edges of the wound.

To absorb this too superfluous flux of undigested matter, I ordered sponge to be applied in the manner described by the ingenious Mr. Kirkland, surgeon, in the second volume of the Medical Observations and Inquiries, page 278. N^o 23. left by the matter being absorbed into circulation, a wasting hectic might ensue.

AT this time I administered the bark, and by this and the application of the sponge, the flux of matter became less in quantity, and more laudable; the fungus remained nearly in

the same state, and the patient free from fever; but soon after the stump grew extremely painful, and assumed a very cancerous appearance.

THE wound now having a much worse look, I ordered it to be fomented with the common fomentation, and to be dressed with basil. flav. softened in ol. terebinth. By the use of these applications, good digestion came on, the fungus gradually sloughed off, and the wound appeared with a much better aspect.

HE still continued the use of the bark; but as the wound healed but slowly, I gave him the extract of cicuta, and ordered the wound to be fomented with a decoction of the herb.

THIS method he continued until the stump was almost healed; but I will not take upon me to determine, whether the bark or the cicuta contributed most to the cure; but this is certain, the wound looked much better, and was in an healing state, before he took the cicuta; yet it seemed to heal faster after he had taken it, and the part had been fomented with a decoction of the herb.

THE last part of the wound which cicatrized, was that over the extremity of this preternatural cartilaginous substance before-mentioned; but this in time skinned over, and the man was discharged perfectly cured, in eight months from the time the operation was performed.

N° III.

Mathematical Disquisitions concerning Muscular Motion. Communicated in the Leipfick Transactions.

By John Bernoullius, M. D. of Bafil.

THE characters in use among mathematicians, and that are brought into this paper, are,

= The mark of equality.

+ Plus.

— Minus.

:: Proportion.

× Multiplication.

FIRST, I suppose, That the fibres which cause muscular motion should represent a hollowed cylinder, if they were divested of the transverse fibrillæ, by which the said fibres are divided into a multitude of spaces, whose cavities communicate one with the other through the whole length of the moving fibre, because of the loose union of the transverse fibrils.

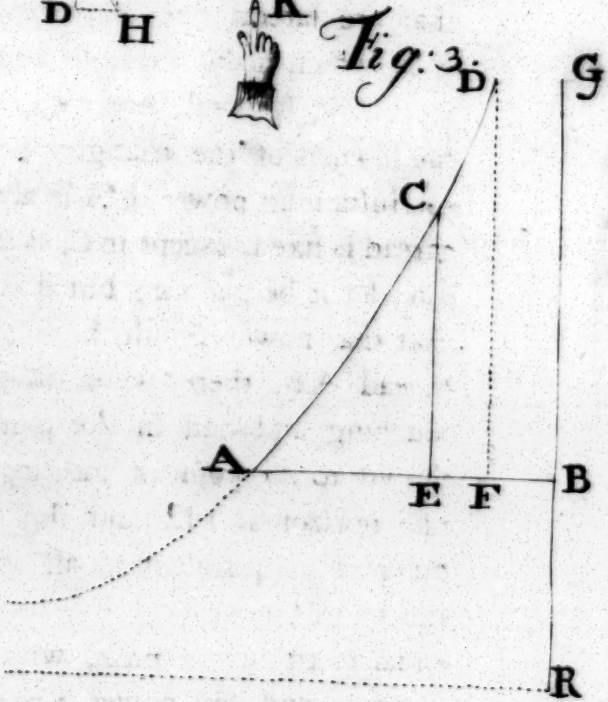
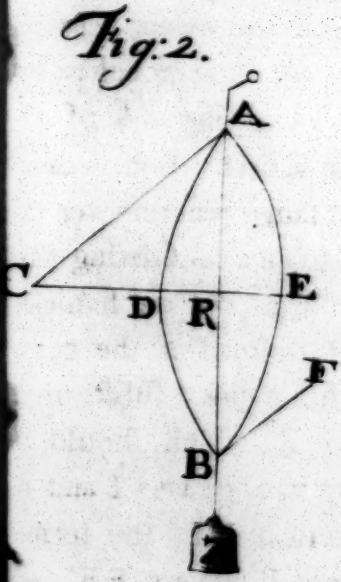
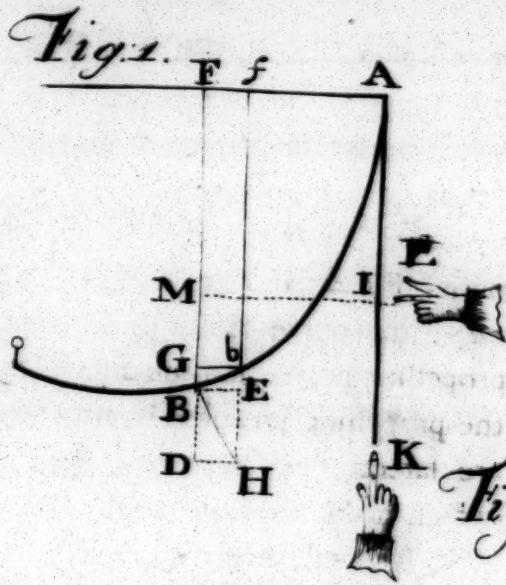
SECONDLY, That there is a sort of agitation of the animal spirits in the brain, when the soul inclines that any one member of our body should be moved; so that by pinching the beginning of any nerve, they force forwards the spirituous liquor contained in it; and by the same irritation of the beginning of the nerve, a small drop of nervous juice is thrown out of the extreme part of the adjoining nerve, by this slight and easy vibration; which, nevertheless, could not happen by any other means than an actual concussion, because the spongy substance of the nerves supplies their want of a valve.

THIRDLY, When infinite numbers of drops are thrown after this manner out of the orifices of the small nerves through the whole body of the muscle (which is always bedewed with blood like a sponge) they do insinuate them-

selves into the blood, by being determined into its thinner particles by the force of their small parts, by which the blood is broke down into smaller particles, and the condensed air that was confined in it finding vent, occasions an ebullition, and the inflammation of the muscles that attend it, by its expansion. These things being supposed, if we enquire, first, about the nature of a curve line, according to which the moving fibre is expanded, it may be thus determined.

FIG. 1. (plate I.) Let ABC be a fibre; or if you will, a flexible thread fastened to the extremities of A and C, which in all its points B is drawn or propelled perpendicularly to its bending by an equal and indefinitely small force, which is here represented by the line BH; and let the abscissa AF be $=x$ its differential $Ff=dx$; the applicate FB $=y$, its differential GB $=dy$; the curve AB $=f$, its differential Bb $=ds$; BH (the propelling power and the multiplex of Bb) $=nds$, because now the propelling power BH may be divided into two others that are lateral, one horizontal BE, and the other vertical. BD, which make the right angle DE, whose diagonal is the very BH; BE will be $=ndy$, and BD $=ndx$, because of the the likeness of the triangles BGb, and BDH. But because the sustaining power in A is always the same wheresoever the thread is fixed, except in C, as it is plain to any considering person; let it be put $=a$; but it is evident from the mechanicks, that that power should be as great as if, instead of the curve thread AB, there were other two strait ones substituted, touching and tied in the points A and B, which should be drawn to the point of meeting in I, by two powers I and K, one horizontal IL, and the other vertical KI; the former whereof is equivalent to all the horizontal powers BE, and this to all the vertical BD taken together; but all in BE are equal to the whole ndx , which is $=nx$; therefore the power L $=ny$, and the power K $=nx$. Wherefore that we may discover the partial power in A, which is only required to sustain the power L, we must say (as Mr. Varignon teacheth

Plate VI



Medical Museum

[illegible]

and to the influence power is A

It is a very common mistake to suppose that the
 only way to get rid of a bad habit is to
 try to suppress it. This is a very dangerous
 policy, for it only makes the habit stronger.
 The only way to get rid of a bad habit is to
 replace it with a good one. This is the only
 way to win the battle of the wills.

us in his fundamental proposition about suspended weights) as the sine in the angle AIB, or its complement to two rights KIB, to the sine of the angle MIB *he*, as IM is to MG or as G is to GB *he*. As dx is to dy , so the power L or ny is to the partial power in A, which therefore is found $= \frac{nydy}{dx}$. Now because the direction of the power K is the tangent KI, this will all be sustained by the point A; and therefore that we may have the total and constant power in A, which we put $=a$, we must add the power K or nx to the partial power $\frac{nydy}{dx}$; and so we shall make out this different equation $\frac{nydy}{dx} + nx = a$ which multiplied by dx gives $nydy + nxdx = adx$; and by taking the integrals we shall have half $nyy +$ half $nxx = ax$ or $yy + xx = \frac{2ax}{n}$ which equation shews that the proposed curve ABC is circular, whose radius or semidiameter $= \frac{1}{n}a$; which was to be found. Wherefore, if a muscle were not stretched and drawn out in length by the resistance it is to overcome, its little machines should be expanded in perfect and intire circles; but because it has always weights and resistances of its own, and of the bones to remove, besides those that come from without; therefore it is that these muscular machines which we consider as planes, never obtain a circular figure intirely, but a figure made up of two equal segments of the same circle. By the same proposition of Varignon, the sustaining power in B, as the power of firmness, which is requisite that the thread may not break, is found every where equal to the sustaining power in A.

SECONDLY, If we enquire into the proposition between the inflating and sustaining force, or requisite strength of the fibre *he*; if when the powers in n or BH do increase or lose, we would determine in what proportion the sustaining powers in A or B do get or decrease, the radii of the circle still remaining equal:

equal: Let BH be put $=mdf$, and the sustaining power in A or B $=b$, and we shall have the equation $yy+xx=\frac{2bx}{m}$;

but because the radii are put equal, $\frac{b}{m}$ will be $=\frac{a}{n}$ and therefore $nm :: ab, b.e.$ the sustaining powers or requisite strengths of the fibres, are in the same ratio with the inflating powers, which my brother found out the same way, as we may see in the rules which he hath published in May 1693, in the Leipfick Transactions, concerning the curvature of a fail.

THIRDLY, These things being premised, we may easily reckon the proportion that is betwixt the dilating power and the resistances; or how great an elasticity of motive air is requisite at every sublevation of equal resistances, upon which account almost all Borellus's works were made. Let therefore BEAD be a muscular machine, made up of two segments of a circle BDA and BEA, C the center arch AEB, and the radii CA, CE, being drawn, the former to the extremity, and the other through the middle of the machine (Fig. 2.) so that DE may be the greatest breadth, which the greatest length AB, or the chord of the arch AEB or ADB cuts in two in R; now because the angle EAC $=$ to the right which is $=RAC+ACR$, the angle EAR will be $=ACR$, and therefore the arch AE is the measure of the angle EAR, or the double BEA the measure of the double EAD. Wherefore the half length of the machine *be* of the arch AE in 100000 equal parts, and half of the angle of dilatation EAR being given, we may find the sublevation of the resistance *z*, it being double to the excess by which the arch AE is more than its right sine AR; which is thus done: say, As the circumference of a circle to the radius *be*, as 44 is to 7, so is the number of degrees of circumference 360 to a fourth $57\frac{3}{4}$, which will be equal to the radius in degrees. Then say as the number of degrees of the angle EAR, or the arch EA is to $57\frac{3}{4}$; so the number of the 100000 equal parts of the length of the arch EA is to a fourth,

fourth, which will be equal to the number of equal parts of the radius AC, of which the arch EA contains 100000: and hence we shall have the length of AR itself, by saying, that as the whole sine is to the sine of the angle EAR, or of the arch EA, so the number of the parts of the radius AC already found is to a fourth; for this fourth is equal to the number of equal parts of AR itself, whereof the arch EA contains 100000: and therefore the double excess of the arch AE, over and above the sine AR now found, will be the desired sublevation of the resistance Z. Q. E. I.

FOURTHLY, Now we have discovered the sublevations, we shall determine the respective dilating force after this manner. We put before (N^o I) the curve power in any point, or rather in any differential of the curve pressing perpendicularly $=nds$: therefore the dilating power, or the absolute force of the elasticity of the motive air, whereby the sides of the machine are dilated, is expressed by n ; but by putting the sustaining force in any point of the thread $=a$, we found before that the radius of the arch of the circle to which the thread does bend to be $=\frac{i}{n}a$. Now because by the mentioned proposition of Varignon, the resistance Z is to the sustaining power in B, whose direction is the tangent BF, as the sine of the angle EBD, to the sine of the angle EBR; therefore is $a = \frac{Z M \text{ sine of } EBR}{\text{sine of } EBD}$ and so the value of a being substituted in its place in the quantity $\frac{i}{n}a$, we shall have the radius (found by the mentioned way, which therefore we shall call r) $= \frac{Z M \text{ of the sine } EBR}{n M \text{ of the sine } EBD}$; and therefore the absolute force of the elasticity of the motive air $n = \frac{Z M \text{ of the sine } EBR}{r M \text{ of the sine } EBD}$: and consequently the force by which the half-side of the machine is prest, *h. e.* nAE will be

$= 100000$

$$= \frac{100000 \text{ z M sine EBR}}{r \text{ M sine EBD}}.$$
 By means of this calculation, I

have contrived a table like that Borellus made for his Hypothesis, which, if compared with mine, there may be seen a vast difference, both as to the moving force and the sublevations; for he makes them every where either more or less than they should be.

Now it is evident, by this table, that a muscular bladder AEBD can never be intirely of a circular figure, because the absolute force of the elasticity should be infinitely greater than the resistance, which cannot be; and because the greatest contraction of the machine, or sublevation of resistance, which is not equal to 72728 parts of those of which the half length of the side contains 100000, it is also evident, that no machine can be contracted to its third part, in its greatest distention; all which must be thought as said of a muscle. Hence it is obvious too that a very small ebullition in muscles can produce their immense and incredible energy; because, in the beginning of the inflation, when the angle of the half-dilatation EAR is very acute, the resistance bears a very great proportion to the absolute force of the elasticity of the motive air: since if we suppose the angle EAR of 30 minutes, the resistance is to the power of the elasticity, as 22,900000 to 1; so that the least inflation of muscles is able to counterbalance any great resistance, and that therefore a very tender infant may raise any weight whatsoever; but the sublevation becomes the more insensible the greater the resistance is, than the motive power of the elasticity.

FIFTHLY, When we would know the quantities of animal spirits, which are expended on every resistance, while the sublevation of resistances continues the same, they may be found in this way.

THE inflating powers *be*, the absolute powers of elasticities of motive air in equal circles, are proportional to the sustaining powers by *nz*. But because (by Varignon's proposition) the sustaining powers are in the ratio of the resistances

sistances Z, the resistances must also be proportional to the elasticities, while the sublevation of the resistance remains, or the angle EBD is always the same. Moreover we take it for granted, that the quantities of the motive air, *b. e.* that the densities of the same volume of motive air, and the quantities of animal spirits or nervous juice, are always in the same proportion; *b. e.* that a double, treble, or quadruple quantity of nervous juice, does excite thicker motive air in a double, treble, or quadruple proportion. Therefore the whole matter should be concluded, if we knew how the elasticities increase while the densities do. This we may search after this way.

FIG. 3. In a determined volume *a*, I conceive that the particles of air take up the space *b*, and that the materia subtilis, the remainder of the volume, possesses the space *a—b*. Now I conceive another quantity of elastical air C, in an equal volume *a*, so that the remaining space of the materia subtilis may be *a—c*; and therefore, by the demonstrations my brother has made in the 97th page of his book de Gravitate Æther, the elasticity of the air of the first volume, is to the elasticity of the second, in a compound ratio of a reciprocal proportion of the spaces possessed by the materia subtilis, and a direct one of spaces filled with air, as, viz. *ab—bc* is to *ac—bc*; but the density of the first is to the density of the second, in a direct ratio of airy spaces, as, viz. *b* to *c*. If therefore we construct a curve, ACD to the axis of AF of this sort, that AB in the axis being taken $=a$, and the applicates DF, CE being drawn, the right angle under BE and AF, may be to the right angle under BF and AE, as DF to CE, and if the abscissa's AE, AF be taken for the densities of the air contained in the volume expressed by the given line AB, the applicates DF, CE will be its elasticities. If we enquire analytically for an equation that may express the nature of the curve ACD, let us put the given line $AB=a$, and another taken at will $BF=f$, $DF=g$, the abscissa $AE=x$, and the applicate $EC=y$; and we shall find this equation $fgx=axy-afy-$

VOL. II. E *axy*

$axy + fxy$, which shews that the required curve is an hyperbola; and the applicate BG in B, is an infinite, and therefore the asymptoton of the hyperbola, whose center may be had by producing the asymptoton GB to R, so that BR may be a fourth proportional to AF, FD, and BF, the transverse half axis is equal to the mean proportional between BR and the double of AB. Hence it is evident, that the elasticities, but especially in a very condensed air, do increase in a far greater proportion than the densities themselves; for the elasticity becomes at length infinite, when the density becomes as great as it can be, and yet is no more than finite.

Now since we have taken the densities of motive air of the same volume, proportional to the quantities of animal spirits expended in producing it, while they fermented with the blood, and the elasticities are proportional to the resistances, we may conclude that the very same hyperbola ACD, does also determine the relation of resistances to the quantities of expended spirits *b. e.* if CE, DF design the resistances, AE, AF will denote the quantities of expended spirits. Now let the volume of the muscular machine, or, which is the same thing, let the volume of all the machines of a muscle taken together (which volume is represented by AB) be of 10 parts, BF, or $f=1$, FD or $g=100000$, and if the quantity of animal spirits *b, e*, AE, or x , be of 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 parts, it will be found by that equation of the curve CE, or y ; that is, that the weight to be raised is respectively of 1234, 2778, 4762, 7407, 11111, 16666, 25926, 44444, 100000 infinite parts. This is the reason that great weights (proportionate to our strength) may be raised to the same height, with little more trouble than small ones; for I am of opinion that the whole difficulty about the performing of animal motions, proceeds entirely from the waste of animal spirits; but the spirits are consumed in a far lesser proportion than the weights to be raised: for example, if we are to raise any thing of a double weight, it is not requisite that there be a double quantity of animal spirits

spirits employed, as is evident by this calculation; whereby we find by the help of a quantity of animal spirits, which is as 8, there may be a weight raised four times greater than another quantity which is as 5; though the waste in that case be not indeed twice greater than the waste in this, for they are as 8 to 5. Therefore the difficulties also which we find in lifting up weights, are in this proportion.

N^o IV.

An Account of an extraordinary Case of the Efficacy of the Bark in the Delirium of a Fever. By Nicholas Munckley, M. D. Physician to Guy's Hospital, and F. R. S.

ON Sunday the fifth of March, I was sent for to a gentleman of about 30 years of age, who had been for some days ill of a fever. I found him with a degree of heat considerably above what was natural, and with a pulse rather low but quick, and beating, as measured by a stop watch, about an hundred strokes in a minute. In this situation he continued, without any remarkable alteration, for the two following days; and from the appearance of this disease, I imagined that it would not be speedily terminated.

ON Wednesday, the third day of my seeing him, I found him, however, much better, his heat being considerably abated, and his pulse being more than twenty strokes in a minute slower than it had been the day before. On this alteration, so much in his favour, it might have been thought he was growing well, had it not been that there was no appearance, either by sweat or urine, or on the skin, by which it could be imagined the disease was perfectly judged.

ON this account no alteration was made in his treatment that day; but finding the next morning that he had slept well the preceding night, and that his pulse continued quiet, being no more than 71 strokes in a minute, he was allowed to get up in the evening to have his bed made; and I should have thought him well, had not every appearance of a critical separation being still wanting. On this account I thought him to be very liable to a return of his fever, and therefore when early the next morning I was informed that he had been quite delirious the whole night, I was not greatly alarmed, as thinking he had a feverish paroxysm, to which the Bark would probably put an end. When I saw him that morning, I found him very delirious, but to my great surprize, quite free from all kind of fever whatsoever; his pulse being then as calm as it had been the preceding day. In this condition he remained all that day, and the following night; nothing that was attempted to relieve him having done him the least service; on the contrary his delirium increased so much, as to make it very difficult for the attendants to keep him in bed.

THE next morning he was much as he had been the day before; his imagination continuing greatly disturbed, and he at times laughing, and playing antic tricks, and using jestures, the most opposite to his common demeanour when well, and which, though the pulse had not been so perfectly quiet, had more the appearance of a mania, than of the delirium of a fever.

IN this unhappy situation there was but one thing which seemed likely to bring the affair to a speedy determination; this it was proper to attempt, though the indications for it were very obscure, and the event perfectly uncertain. On recollecting the time of this delirium's coming on, which was about 36 hours after the pulse had grown quiet, and perceiving that one glass of water, which had been made in the night, was thick, and seemed disposed to drop a sediment, there was some

reason to suspect, and indeed to hope, that though the pulse had been perfectly calm during the whole time of the delirium, there was something of the fever still at the bottom of this complaint.

FROM these indications, obscure as they were, it was judged proper to make a tryal of the Bark, which was accordingly ordered to be taken immediately, and to be repeated every two hours. This method succeeded beyond what could have been imagined, insomuch that it was observable even by the attendants on this gentleman, that his mind came evidently more and more to itself after every dose; and in the evening after he had taken six drachms, his urine grew thick, and dropt a lateritious sediment; and excepting the weakness, naturally consequent on such violent emotions as he had undergone, both of mind and body, he was as well as ever he had been in his life. He hath repeated the Bark at proper intervals, as is usual after intermittent fevers, and continues to this day perfectly well.

THE use of the Bark in the most irregular intermittent disorders, is very happily so well known in this island, that it might, perhaps, have been thought needless to have recited any case merely in confirmation of this practice; and I am too well aware of the insufficiency of every thing, but a number of facts on which to found any philosophical truth, to presume to rest any thing on one single instance only. But the case above related is of so very extraordinary a kind, as to make it worthy of being mentioned, both on its own account, and for that analogy which, being found by experience to subsist between diseases, affords the surest method of reasoning on practical subjects. The two remarkable circumstances of this case are, the deliriums coming on and continuing without any exacerbation of the pulse, and the Bark proving so speedy and effectual a remedy, though given at a time when there was no appearance of any remission of the symptom
which

which it was intended to remove. It hath been thought that a quick pulse is so essential to the definition of a fever, as to be a pathognomonic symptom of it: but experience is against this notion; perhaps the present case is a proof of the contrary; however this be, there have not been wanting instances in which, towards the end of a fever, the pulse has grown quiet without the abatement of any other symptom, and the patient has generally lain comatose, and with the appearance of one who hath taken a large quantity of opium.

GALEN, in the third book of the Presages of the Pulse, mentions this symptom, and pronounces it to be almost a fatal sign; and the same thing hath happened in more instances than one, which have come to my knowledge. May not then the above recited case lead to this useful enquiry? Whether, in fevers of every kind, when the pulse is quiet, the Bark is not proper to be given, and likely to prove a remedy? In this case it proved absolutely such, and that it is at least a safe medicine in all such cases, in which any practitioner of experience or judgment would ever think of giving it, is now certainly known; for my own part, I can safely declare, that in near ten years experience of it in Guy's Hospital, during which time I find I have given it, on different occasions, to above 500 patients in that house only; I never, from the most accurate observation I could make, saw it do any harm, or bring on any bad symptoms, even in cases where it did not succeed according to the intention for which it was ordered: and (which I thought worth remarking) in chronical cases, even in those where the Bark hath been by many thought the most prejudicial when, on the coming on of an intermittent fever, the Bark hath been necessary to cure this secondary disease, the original distemper hath gone on, according to the best judgment I could form of it, exactly in the same manner as it would have done, had the Bark never been given.

N^o V.

An Account of the Death of the Countess Cornelia Baudi of Cesena; who was consumed by a Fire kindled within her own Body. With an Inquiry into the Cause, supported by Instances of a like Nature. By J. Bianchini, Prebendary of Verona.

THIS lady was in her 62d year, and well all day till night, when she began to be heavy; after supper she was put to bed, and talked three hours with her maid; at last falling asleep the door was shut. In the morning, the maid going to call her, saw her corpse in this deplorable condition. Four feet distant from the bed was a heap of ashes, two legs untouched, stockings on, between which lay the head, the brains, half of the back-part of the skull, and the whole chin burnt to ashes, among which were found three fingers blackened. All the rest was ashes, which had this quality, that they left in the hand a greasy and stinking moisture. The air in the room had foot floating in it: a small oil lamp on the floor was covered with ashes, but no oil in it. Of two candles on a table, the tallow was gone, but the cotton left, some moisture about the feet of the candlesticks; the bed undamaged, the blankets and sheets only raised on one side, as when one gets out of bed: the whole furniture spread over with moist ash-coloured foot, which penetrated the drawers, and fouled the linen. This foot even got into a neighbouring kitchen, hung on its walls and utensils, and a bit of bread covered with this foot, was refused by several dogs. In the room above, the said foot flew about, and from the windows trickled down a greasy, loathsome, yellowish liquor, with an unusual stink. The floor of the chamber was thick smeared with a gluish moisture, not easily got off, and the stink spread into other chambers.

THE narration is followed by an enquiry into the cause of this conflagration; the result of which is, that it was not from the lamp, nor supernatural, nor from a flash of lightening, but from her own body; though some concluded that it must be the effect of a fulmen. The dogs refused the bread, because of the sulphureous stink, and nothing but a fulmen could reduce a body to impalpable ashes. But it seems there was no sulphureous or nitrous smell of fulmen, and the effects of it would not reduce a body to impalpable ashes.—Our author thus maintains his opinion :

“ THE fire was caused in her entrails by inflamed effluvia of her blood, by juices and fermentations in the stomach, and many combustible matters abundant in living bodies, for the uses of life; and lastly by the fiery evaporations which exhale from the settlings of spirit of wine, brandies, &c. in the tunica villosa of the stomach, and other fat membranes, engendering there (as chymists observe) a kind of camphor; which, in sleep, by a full breathing and respiration, are put in a stronger motion, and, consequently, more apt to be set on fire.”

“ That fat is an oily liquid separated from the blood by the glands of the membrana adiposa, and of an easy combustible nature, common experience shews. Also our blood, lymph, and bile, when dried by art, flame like spirit of wine at the approach of the least fire, and burn away into ashes. [Observ. 171, in the Ephemeris of Germany, Anno X.]”

“ SUCH a drying up may be caused in our body by drinking rectified brandy, and strong wines, if mixed with camphor; as monsieur Lître observed in the dissection of a woman 45 years old, in the history of the Royal Academy of Sciences, 1706, p. 23.”

“ BESIDES, although the salts in living and vegetable creatures are not naturally inclined to kindle, they often contribute
to

to it, when joined by a strong fermentation. Thus the mixture of two liquors, although cold to the touch, produces a flaming fire."

" BECHER was the first discoverer of this marvellous phenomenon, by mixing oil of vitriol with that of turpentine. Borrichius afterwards did the same, by mixing oil of turpentine with aqua fortis; and at last monsieur Tournefort, by joining spirit of nitre with the oil of fassafras; and monsieur Homberg with this acid spirit, together with the oil and quintessences of all the aromatic Indian herbs: nay, Mr. Homberg asserts, that with a certain cold water cannons were fired anno 1710, in the abovesaid history of the Academy of Sciences, p. 66."

" BY fermentation, magazines of gunpowder, barns, paper-mills, and hay-cocks, have been set on fire."

" THERE is further to be considered the vast quantity of effluvia that emanate from our bodies. Sanctorius observed, that of eight pounds of food and drink in a day, there is an insensible perspiration of about five; computing with them those effluvia which go out of the mouth by breathing, and which might be gathered in drops on a looking glass. [Sect. 1. Aphor. 6.] As also, that, in the space of one night, it is customary to discharge about sixteen ounces of urine, four of concocted excrements by stool, and forty and more by perspiration. [Aphor. 59.] He teaches also, that numbness is an effect of too much internal heat, by which is prevented such an insensible transpiration, as in this very case.—

" THE friction of the palms of our hands, or of any other parts of our body, may produce those fires commonly called ignes lambentes."

WE learn of Eusebius Nierembergius, that such was the property of all the limbs of the father of Theodoricus: such

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were those of Charles Gonzaga, duke of Mantua, as the celebrated Bartolin took notice of. By the testimony of John Fabri, M. D. a noted philosopher, who saw it, sparkles of light flashed out of the head of a woman, while she combed her hair. Scaliger relates the same of another. Cardanus, of a Carmelite monk, whose head continued thirteen years to flash out sparkles, every time he tossed his cowl on his shoulders. Ezekiel a Castro, M. D. wrote a treatise, intituled, *ignes lam-bens*; on the occasion that the countess Cassandra Buri, of Verona, when she rubbed her arms with a cambrick handkerchief, all the skin shined with a very bright light. Eusebius relates the same of Maximus Aquilanus. Licetus of Francis Guido, a civilian; and that he knew Antoni Ciancio, a book-feller in Pisa, who, when he shifted, shined all over with great brightness. Libavius relates the same of a youth; and Cardanus of a friend of his; saying, that when he shifted clear sparkles of fire shot forth of his body. Father Kircher, a Jesuit, relates, how he, going in company into a subterranean grotto at Rome, saw sparkles of fire evaporate from the heads of his companions, grown warm by walking. Father Alphonso d'Ovale was eye-witness on the highest mountains of Peru and Chili, how both men and beasts there seem shining with the brightest light from top to toe."

"THESE flames seem harmless, but it is only for want of proper fuel. Peter Bovistean asserts, that such sparkles reduced to ashes the hair of a young man. John de Viana, in his treatise, intituled, *De peste Malagenfi*, p. 46. relates how the wife of Dr. Freilas, physician to cardinal de Royas, archbishop of Toledo, sent forth naturally, by perspiration, a fiery matter, of such a nature, that if the roller that she wore over her shift was taken from her, and exposed to the cold air, it immediately was kindled, and shot forth like grains of gunpowder*."

* Pet. Borelli, *Obs. Cent. ii. Obs. 75.* says, there was a certain peasant, whose linen, hempen thread, &c. if laid up in boxes, though wet, or hung upon sticks in the air, did soon take fire.

AFTER

AFTER all this, I saw, that a feverish fermentation, or a very strong motion of combustible matters, may rise in the womb of a woman, with such an igneous strength that can reduce to ashes the bones, and burn the flesh. Two such cases are known, one in the *Acta Medica Hafniens.* An. 1673, and the other in *M. Marcell. Donat. de Medic. Hist. Mirab. lib. iv.*"

"THE bile, which is a necessary juice for our digestion, was observed by P. Borelli, when vomited up by a man, to boil like aqua fortis. [*Centur. ii. Obs. 1, p. 109.*]"

"BESIDES, very strong fires may be kindled in our bodies, as well as in other animals of an hot temperament, not only by nature, but also by art; which, being able to kill, will serve for a better proof of my argument. *Obscr. 77. in the German Ephemerides, 1670.*"

"Tie the upper orifice of the stomach of an animal with a string; tie also its lower orifice; then cut it out above and below the ligatures, and press it with both hands, so that it swell up in one side; which done, let the left hand keep it so that the swelled part may not subside; and, with the right, having first, at an inch distance, placed a candle, open it quick with an anatomical knife, and you will see a flame there conceived, coming out in a few seconds of time: and such a flame may, by the curious, be perceived not only in the stomach, but also in the intestines. The first discoverer of this was Andrew Vulparius, anatomy-professor at Bologna in Italy 1669. Thus a quick and violent agitation of spirits, or a fermentation of juices in the stomach, produces a visible flame."

"THE German Ephemerides, anno x. p. 53. by Sturmius, says, That in the northmost countries, flames evaporate from the stomachs of those who drink strong liquors plentifully.

OF three noblemen of Courland, who drank, by emulation, strong liquors, two of them died scorched and suffocated by a flame forcing itself from the stomach."

"MY lord Bacon, in his Nat. Univ. Hist. assures, he had seen a woman's belly sparkling like fire; and such flames would often rise in us, if the natural moisture did not quench them; as Lucretius observes, V. 868. L. IV. and V. 1065. L. VI. Marcellus Donatus, in his Mirab. Hist. Medic. says, That in the time of Godfrey of Bologna's christian war, in the territory of Niverva, people were burning of invifible fire in their entrails, and some had cut off a foot or an hand where the burning began, that it should not go further."

"AFTER these and other instances, what wonder is there, says our author, in the case of our old lady? Her dulness before going to bed was an effect off too much heat concentrated in her breast, that hindered the perspiration through the pores of her body, which is calculated to about 40 ounces per night. Her ashes, found at four feet distance from her bed, are a plain argument, that she, by natural instinct, rose up to cool her heat, and perhaps was going to open a window."

"IT is said the old lady was used, when she felt herself indisposed, to bathe all her body with camphorated spirit of wine; and she did it perhaps that very night. This is not a circumstance of any moment; for the best opinion is that of the internal heat and fire; which, by having been kindled in the entrails, naturally tended upwards; finding the way easier, and the matter more unctuous and combustible, left the legs untouched; the thighs were too near the origin of the fire, and therefore were also burnt by it; which was certainly increased by the urine and excrements, a very combustible matter, as one may see by its phosphorus. Galenus (Class. 1. lib. iii. de Temperam.) says, That the dung of a dove was sufficient to set fire to a whole house: and the learned father

Casati, a Jesuit, in his *Phyf. Differt.* part 2. p. 48. relates to have heard a worthy gentleman say, That, from the great quantities of the dung of doves, flights of which used, for many years, nay ages, to build under the roof of the great church of Pisa, sprung originally the fire which consumed the said church*. The author concludes, that certainly the lady was burnt to ashes standing, as her skull was fallen perpendicular between her legs; and that the back-part of her head had been damaged more than the fore-part was, because of her hair, and of the nerves, whose principal seat lies there: and besides, because in the face there were many places open, out of which the flames might pass."

[Two similar instances are added; one of John Hitchell, of Southampton, whose body being fired by lightening, continued burning for near three days, without any outward appearance of fire, except a kind of smoke from it. The other of one Grace Pett, a fisherman's wife of Ipswich; who going down into the kitchen, when she was half undressed for bed, was there found the next morning lying on the right side, extended over the hearth, with her legs on the deal floor; her body appeared like a block of wood, burning with a glowing fire without flame, the trunk covered, like charcoal, with white ashes, and her head and limbs much burnt; there was no fire in the grate, the candle was burnt out of the socket, a child's cloaths on one side of her, and a paper screen on the other were both untouched, and the deal floor was not discoloured, though the fat had so penetrated the hearth as not to be scoured out.]

* *Galēn de Morb. Diff.* Pigeons dung takes fire, when it is become rotten.

N^o VI.

Of Bezoar Stones and Pearls.

THE first stones that bore the name of Bezoar were brought from the East; since the discovery of America there have come from thence stones, which being pretty much conformable to the first in structure and in virtue, have likewise received the same name. There are likewise other stony substances taken out of animals, and disposed in lays, which have been named Bezoar, by adding to them the name of the animal from which they were taken; such are the stones called Monkey Bezoar. Some, taking the word Bezoar in the signification of a counter-poison, have applied it indifferently to all substances that had this virtue: from thence it is that the name hath been given to chemical compositions, such as the Mineral Bezoar, &c.

FROM the observation that the Bezoar Stone was disposed in lays, the name hath been given to a sort of figured stone, such as is found in America, in different parts of the earth, and to which the same virtues are likewise attributed: we find this sort of Bezoar in Italy, Sicily, and even in France in different places, and particularly in Languedoc.

WE have mentioned in general the different substances known under the name of Bezoar; but, to speak properly, the Bezoar is a stony substance taken out of some animal, composed of several lays or coats like an onion, and which hath some virtue for resisting poison: the two principal species, as we have already said, are the oriental and occidental. We know in general that this stone is found in the stomach of a kind of wild goat that browses on aromatic plants. If Tavernier is to be believed, there are several of these stones found in the same animal, which may be known by the touch;

touch; the stones are of different figures and sizes: there are some which have the shape of a kidney or a bean, others are round, oblong, or of an irregular figure; the middle or centre of the stone is commonly occupied by some hard body. I have found in the centre of several that I have opened straws, hair, marcasites, flints, gravelly substances, united together and as hard as stone; I have likewise found tale, wood, stones resembling cherry-stones, nuts of various sorts, and pieces of nuts.

I IMAGINE that the substances included in the Bezoar serve precisely to indicate the manner in which it is produced; these solid and undigested bodies remaining in the stomach of the animal, may irritate the glands of it, and the lymph continually thickening, together with the juices of the aromatic plants that the animal feeds on, round those bodies or buds, as Tavernier calls them, may well be supposed to form the polished lays.

I OBSERVE likewise that whatever body makes the centre of this stone, the lays of it are so delicate and so well turned, that externally the stone hath the figure of the substance which is included within; thus, for example, if it be a straw, the stone will be long; if a flint, it will keep that figure, &c. inasmuch, that by the shape and weight one may guess what substance they contain.

EVEN the Fossile Bezoar is formed in the same manner, having in the centre some foreign body, round which the Bezoardic strata are formed and ranged: in the fossile kind, Bocconi hath observed nuts of different sorts, flints, gravel-stones, wood, metal, coal, &c. I have examined, says Mr. Geoffroy, some that are called Priapolites, which grew in Languedoc; one of which, given to me by Mr. Bon, had the centre occupied by a piece of rock crystal.

WITH

WITH regard to the Animal Bezoar, we find several of those stones in the stomach of one single animal: Tavernier says expressly, that six of those goats had in all seventeen Bezoar Stones that might be felt outwardly and counted; and that the value of the animal increased in proportion to the number of stones that were felt. This agrees perfectly with what Clusius relates of the animal that bears the Occidental Bezoar; he says, that a friend he had at Peru, and who first discovered the Occidental Bezoar, being desirous to know how these stones were formed in the body of these animals, dissected one, and found in the stomach a kind of pouch, where those stones were ranged in a row like the buttons on a coat.

THESE two passages are intirely opposite to what Pomet tells us, who pretends that there cannot be above one Bezoar Stone in the stomach of each animal; indeed he assures us that he would not dare to contradict authors who have treated of it, if he had not in his hands a proof to justify his opinion. This affair is proper for our examination, and the more so, because no one that I know of hath publicly shewn the error of Pomet, on the pretended coat of the Bezoar animal, which he says is one of the greatest curiosities that hath been seen for a long time in France.

THIS coat, says he, is about the bigness of a goose's egg, garnished outwardly with rough hair, short, and of a dun colour; which being cut open, you find there a thin and brown shell, which serves for a covering to another shell that is white and hard as bone, wherein is contained that stone to which the name of Bezoar hath been given. [Pomet's Treatise of Drugs.]

Now this so singular a covering, of which he pretends to have made the discovery, is not at all a part of the animal which bears the Bezoar; it is an exotic fruit, in which Pomet,

met, or some quack by whom he let himself be deceived, had incheafed very dexteroufly a Bezoar Stone : this fraud was detected about a year ago. As I was examining with Mr. Vaillant and Mr. De Juffieu, demonstrators of botany at the royal phyfic garden, this fingular piece of the collection of Mr. Pomet, we were fatisfied that this pretended covering could not be a part of any animal, and must be some fruit that was but little known ; which was afterwards discovered to be true by Mr. Vaillant, who happened to have some of that sort of fruit, and very easily made with it Bezoars, together with their covering, intirely refembling the Bezoar fo much valued by Pomet : the fruit grows on a sort of palm-tree described by John Bauhin, which he calls palma crucifera ; it is described likewise by Theophrastus. The tree grows in Egypt, Nubia, and Erhiopia : Cordus calls it nux Indica minor. It is of use to natural history to discover fuch frauds.

I PLACE in the rank of Bezoar Stones all fuch substances as are formed by lays in the bodies of animals : Pearls, which I rank of this number, deserve it the more, as I have found some of them in certain shell-fish fo like to the common Bezoar, that it is difficult to diftinguifh them at the first fight. These pearls are produced in the shell-fish called pinna marina, five austura Mathioli, of which there is great plenty on the coast of Provence : the Pearls that are found in this shell-fish are not all of the fame water ; some are, as I have faid, perfectly like Bezoar Stones ; others are of the colour of coral and amber ; others again of the colour of pearls, but more leaden. Their shape is commonly that of a pear. All these different varieties of figure and colour do not hinder them from being of the fame nature, fince they are produced in the body of the fame fish. That these Pearls, as well as all others, are formed in the body of shell-fish in the fame manner as the common Bezoar is in the body of thofe goats that fupply it, is not difficult to be proved, fince by breaking them one finds them streaked like certain Bezoars, and formed round

a kernel, which appears itself to be a little Pearl. No one doubts but the oriental Pearls are of the same nature as those which are produced in other shell-fish, such as in the oysters we commonly eat, and the different sorts of muscles; all the difference between them arises only from their different water, but there is through all the same matter and the same construction, as is visible from the different Pearls one finds in the pinna marina: we should therefore consider Pearls as true Bezoar Stones in respect of their nature, although they are not intirely so in respect of their virtue.

I SHALL not relate, says Mr. Reaumur, all that the ancients have delivered fabulous on the origin of the Pearls: natural philosophy is too far advanced to require any proof that they are not produced by a celestial dew, notwithstanding all the assertions of grave authors; those who have taken them for the eggs of fish, where they are found, do not deserve our regard any more than the others.

MR. Geoffroy jun. ranks them amongst Bezoars: he places in this class all stones formed in lays or strata, which are engendered in animals; it is certain that they cannot be considered but as other stones which are formed in animals, such as the stones of the kidneys, bladder, &c. They are, probably, likewise the effect of a disease of the fish. It is by no means surprizing that an animal, that hath vessels where there circulates a sufficient quantity of stony juice to supply the building, thickening and enlarging a shell, should have enough likewise to form stones, if there should happen an effusion of the juice, destined for the growth of the shell, into some cavity of the body, or between its membranes. The stone is called a Pearl when the juice that hath overflowed, and of which it is formed, is of a silver coloured water, approaching to that of mother-of-pearl; and its colour is likely to be such in muscles, oysters, and other pearl shell-fish, whose very shell is of the colour of the nucleus.

As air and aliment render the inhabitants of certain countries subject to certain diseases, so undoubtedly the waters of seas and rivers which fish respire, and are nourished by, cause in them many disorders; from thence it is that nothing is more uncertain than the number of Pearls found in those shell-fish; in some of the *pinnæ marinæ* I have found none at all, in others I have found twenty; muscles of the same species have Pearls in some rivers, and none at all in others: our oysters would perhaps be more precious, if the waters of our seas were less wholesome.

N^o VII.

An Account of Two Stones of remarkable Shapes and Sizes, which for the Space of Six Years were firmly lodged in the Urethra of a young Man, and at length successfully cut out from thence. By J. Warner, F. R. S. and Surgeon to Guy's Hospital.

[From the Philosophical Transactions.]

THE formation and confinement of stony concretions in the different parts of the organs of urine, to wit, in the kidneys, ureters, bladder, and urethra, are diseases which are frequently observed to happen to both sexes of all ages and constitutions: for this reason I am apprised that there are few instances can be given of such peculiarities attending these cases, as may reasonably be esteemed worthy the attention of the curious. But when matters of fact, however common in themselves, are so circumstanced as to assume extraordinary appearances, the uncommon phenomena accompanying such facts, when capable of being pointed out, will, I believe, be always considered by the Royal Society as a sufficient apology for the freedom of the communication. Upon this presump-

tion I have taken the liberty of laying before the Fellows of this Society the following short account, and at the same time of submitting to their inspection as much of the case as the nature of the affair could admit of being exhibited.

C A S E.

THOMAS BINGHAM, a very healthy young man, twenty years old, came from Yarmouth to London in September 1759, and put himself under my care to be cured of a swelling which he had in his urethra: upon questioning the patient, I was informed by him that he had little or no pain, that he had never perceived the least difficulty in voiding his urine, nor had he ever had the least involuntary efflux of it; he had not at any time suffered in the least but from the bulk and weight of something that grew in his urinary passage (urethra) which upon exercise of late proved troublesome to him. Upon inspection I discovered a considerable prominence betwixt the testicles and anus; upon feeling the part with my fingers there appeared a very evident hardness and tumour; by introducing a large, smooth, and ductile probe into the urethra it was evident there was a stone or stones lodged in that passage. I advised the cutting the tumour out, which was complied with; and in the following manner I proceeded to the performance of the operation.

THE patient being supinely placed upon a steady table of a convenient height, covered with a double blanket, and a pillow put under his shoulders, I caused his hands and feet to be tied together, and by proper assistants he was held in the same position as is done in the operation of cutting for the stone in the urinary bladder; I then proceeded to divide the urethra longitudinally by incision; the extent of the incision was from one end of the swelling to the other: the length and size of the wound enabled me to take away the Stones without any violence or difficulty.

AFTER

AFTER the Stones were removed, I brought the lips of the wound together, and with the twisted future I retained them in that situation; by this method, and by occasionally passing a bougie of a proper size into the urethra beyond the farther extent of the incision, the patient went happily on till the cure of the wound was completed, which was effected in about three weeks, and there afterwards remained no inconvenience at all to the patient in voiding or retaining his urine.

As it may probably give some satisfaction to the curious to be informed of the specific gravities of these Stones, I have subjoined these particulars to this memoir:

	Weight in Air,	in Water,	Specif. Gravity,
Large Stone,	308, 5	92,85	1,431
Small Stone,	42,35	10, 4	1,326
Both Stones,	350, 8	102, 9	1,415

QUÆRE, Is it not probable that the Generation of these Stones might originally have begun in the urethra, as the patient did not ever remember to have had the least complaint in his loins, or in any part of his bladder? Or, is it more reasonable to suppose that the Stones were first of all formed in the kidney or urinary bladder, from thence conveyed with the stream of urine when very small, and lodged in the urethra till they had arrived to these sizes?

EITHER of these suppositions to me appears reasonable.

HOWEVER, as hypotheses of this kind are with difficulty ascertained, and as a discovery of the fact, could it be determinately made, would prove of very little consequence to the improvement of the art of surgery, I think it quite unnecessary to dwell upon a part of this subject, in which the benefit of mankind seems to be so little concerned.

THE

THE smallest of the two Stones was situated nearest the neck of the bladder or origin of the urethra: it may be observed, that on the superior part of these Stones there are two long grooves or chanel, which were gradually formed by the streams of urine that were occasionally discharged from the bladder *.

IT may farther be observed, that the whole surface of these Stones, except the parts of them where they lay in contact with each other, or where they continually pressed upon the lower surface of the urethra or bed which they had formed for themselves in this chanel, are rough, and have several eminences arising from them,

N° VIII.

Observations on the Measles.

THE Measles seize children and some grown people of tender habits. The head is oppressed with rheum, which is first discharged at the eyes and nose, the eyelids swell, and the nose is stimulated to frequent sneezing, which opens a passage for the rheum to the windpipe, and brings on a hoarseness, thence it drops into the lungs; upon which, as a part whereon every breath depends, nature is alarmed, and with the utmost efforts ejects the peccant humour through the pores: of these humours the grosser parts remain under the skin in appearance of red spots, like flea-bites, the continuance whereof shortens the disease, and the lungs are propor-

* With the utmost deference to the ingenious author of this memoir, we will beg leave here rather to suppose that these chanel were not formed by the course of urine, that were to suppose the urethra had before been filled with the calculus; the fact is, that during the formation or accretion of the Stone the current of urine preserves a passage for itself, and maintains it, against the petrescent power, by its constant course that way.

tionately

tionately eased of the load. In cold weather, the perspiration being less, the hoarseness and cough continue proportionately longer, and require more of the warm, detergent, and opening medicines; whence it should seem that the Measles go easier off in summer than in winter; and so indeed they do, if the habit is not bad, and the patient has the luck to escape the hot regimen. But it frequently happens after the Measles are gone, the patient purged, and returned to his usual diet, that in the space of ten days after he is seized with a grievous oppression at the breast and great anxiety, a fever, thirst, some spots in the skin of a deeper red than the former, faint sweats, and breathing still shorter, concludes the melancholy scene in a few days, whereof many have died the last summer. Upon which I observe that after the Measles, in warm weather, the lungs remain in a relaxed state for want of cool air; and if the cough goes off soon, the child returns to its usual diet with a voracious appetite, and in a few days overcharges the blood with a crude chyle, whereupon, a slightly cold or even a damp air checking the perspiration, a fever ensues, and the lungs being now the weakest part, are unable to resist the load: nature again repeats its efforts, and, as signals of the utmost distress, throws out spots of a deeper die. A case, indeed, really deplorable!

BUT, however melancholy and dangerous the case, we must use means. A looseness happening now would give great hopes; but to encourage it by cathartics, lenients, or even clysters, would sink the spirits, which our principal intention must be to support, in order to promote a diaphoresis. Teas of the warm pectoral herbs for common liquor will help the circulation; but any further view now by pectorals is impertinent and pernicious, for it is not possible that the child can spit up any quantity to relieve it.

APPLY vesicatories to the left breast, and raise the patient's head as high as you can; give plentifully of syrup of saffron,

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with as much fal volatile in it as the child will bear to take, which will tend to relieve the lungs by supporting the diaphragm, and promote your principal intention. If a looseness happens, the testaceous powders, with saffron and cochineal, will be useful, to which gentle opiates may be added: but if, as before, you raise the pulse sufficiently without procuring sweat, take away a little blood, and repeat your medicine. If yet you support the spirits without gaining your point to the third day, exhibit an emollient clyster, and still continue your medicine, and if you can hold out to the fourth day you are likely to do well.

PREVENTION is better than a cure; but few take such notice until death has thinned the family: however, let them know, as soon as the eruptions disappear, to purge moderately with fenna and prunes for three or four times; but if the hoarseness continues fenna may be given with seeds and syrup of saffron intermediately; that done, remove the patient to the most hilly part of the country, there to be kept from flesh-meat, garden-stuff, milk, cheese, and malt-liquor; nor allowed its fill of any diet: its liquor water or herb teas; and in about a month from the disease (or sooner if complaints arise) purge twice or thrice with pulv. fenn. c. Take it home, and by degrees bring it to its former diet: but if the cough continues with a hectic, take away blood, and give cows milk and tea in equal quantities. The Measles will attack tender habits more than once: I had them at four years old, and was hoarse till the summer came on; I had them again at the age of twenty-two.

Yours, &c.

W.

Nº IX.

N^o IX.

Of DIET in general, and the bad Effects of Tea-drinking.

THE Diet of the People in every country consists chiefly of such animal and vegetable productions as experience has proved to be nourishing, without giving any disturbance to the body. Some other articles are generally super-added to make them more delicious. Animal food is of the highest kind for nourishment and pleasure also, while the appetite lasts; but when that is satiated, flesh-meat is too rich to be continued any longer out of pleasure. Fish indeed is of a lower and poorer nature; yet even that is sufficiently rich to clog the appetite before the stomach can be said to be full. Vegetables may be eaten after either; for there are very few so satiating, but a person may fill his stomach with them after his appetite has been satisfied with fish or flesh. Hence we may observe, that no diet which is very nourishing can be eaten to fulness, because those parts which nourish, are oily and very satiating, as flesh, eggs, &c. but the diet which is less nourishing may, as vegetables in general. There is, however, a very great difference in vegetables, some are of oily parts, and very nutritive, such as peas, beans, almonds, wheat, barley, oats, &c. some less nutritive, and less oily, as turnips, carrots, parsnips, Jerusalem artichokes, potatoes, cabbage, spinnage, fallading. Other vegetables which are eaten for pleasure, have the least oil in them, and nourish the least of all, are apples, pears, plumbs, goofberries, currants, and all the juicy fruits. Providence has furnished every country with a mixture of these pleasant things, along with those which are for our real support; and those which grow in every country, either spontaneously, or by culture, are generally speaking most friendly to the inhabitants. This seems to be a matter of necessity; for as we see different climates frame very different appetites and constitutions; so it is very natural to expect, that our produce for

food in this cold northern isle should be unfit for those in the warm southern parts. A pound of roast beef, and a quart of ale, which is a common meal for a hearty man here, could hardly be eaten by, or if eaten, might endanger the life of, an East-Indian. On the other hand, a piece of sugar cane and a cup of water, which is a very good meal there, would reduce any Englishman some pounds lighter, and render him much weaker in a few days; so that our diet should undoubtedly be of home growth, unless it be of the grain or pulse kind, which grows in all climates, either naturally, or by cultivation.

WHEN Englishmen go to the East-Indies, the diet there is so different from ours, that notwithstanding the English upon the spot have naturalized it as much as possible, yet multitudes die; which I do not impute to the heat of the climate only, but to the diet, which is unnatural to English constitutions, especially that which is used for pleasure. Hence it may be observed, that the disorders which happen to the Indians, upon using our country diet, are of the inflammatory sort; and the disorders which happen to the English upon using theirs, are of the colliquative sort. This shews that our diet is richer and stronger than theirs; and that a changing of ours for theirs does not only hazard our health, but enfeeble our constitutions. The poorness of their diet is undoubtedly the cause of the feebleness and effeminacy of their persons; on the contrary, our English beef and wheaten pudding for eatables, and good ale for drinkables, has very probably been the foundation of the ancient English strength, the daily decrease of which I cannot mention without much regret.

THE Chinese, and many other of the eastern people, make tea the principal part of their drink; and of this they are almost perpetually sipping. This may be a great cause of the manifest effeminacy and diminutiveness of their persons; for what other reason can we assign so probable, for the obvious consti-

constitutional difference between them and the more robust people, who live almost under the same lines and latitude?

Now for the nature of tea, of which there are several sorts: but as they are but one kind of plant, and differ only as malt may do in being high or slack dried, or being finer or coarser, so I shall consider them all as one. Tea is a leaf of a small shrub, of the kind of our dog-tree; of an austere, bitter, astringent taste, without any aromatic warmth. It has but very little oil in it, and that which it has is of the resinous kind, and is narcotic and stupefactive. It has also but a very little salt, and that is of the fixed kind.

If we compare the nature of tea with the nature of English diet, no one can think it a proper vegetable for us; it has no parts fit to be assimilated to our bodies; its essential salt does not hold moisture enough to be joined to the body of an animal; its oil is but very little, and that of the opiate kind; and therefore it is so far from being nutritive, that it irritates and frets the nerves and fibres, exciting the expulsive faculty, so that the body may be lessened and weakened, but it cannot be increased and strengthened by it. We see this by common experience; the first time persons drink it, if they are full grown, it generally gives them a pain at the stomach, dejection of spirits, cold sweats, palpitation of the heart, trembling, fearfulness, taking away the sense of fulness though presently after meals, and causing a hypochondriac gnawing appetite. These symptoms are very little inferior to what the most poisonous vegetables we have in England would occasion, when dried and used in the same manner.

THESE ill effects of tea are not all the mischief it occasions. Did it cause none of them, but were it entirely wholesome, as baum or mint, it were yet mischief enough to have our whole populace used to sip warm water in a mincing effeminate manner once or twice every day; which hot water is sipped out of a

nice tea-cup, sweetened with sugar, eating at the same time a piece of thin bread, loaden with a quantity of butter equal to the bread, by which the stomach is often so relaxed, that its digestive power is destroyed; it becomes inflated with wind, sour belchings ensue, and then perhaps a dram may be thought requisite to ease the stomach; which was not calculated to be mocked with such trifling slip-slops, unfit to satisfy the appetite of the healthy, and unable to support the strength of the laborious. In this manner the robust are rendered feeble, their ancient vigour unnerved; and women hereby become vapourish, low-spirited, and barren; or if they breed, their blood becomes so poor that they have not strength to suckle; and if they do, the child rather pines thereby from a crude and watery diet, or perhaps dies in a consumption. In short, this custom of tea-drinking gives an effeminate weakly turn to the constitutions of the people in general. The children of the poor which are bred with it, as they really are in the cities and towns, are only fit for footmen and chambermaids, but very improper for the stout husbandman, seaman, labourer or soldier.

MAY not this ill diet be the general cause of the want we have of labourers, the advanced expence of labour, and the prodigality which servants have shewn for these last 50 years? It is now become a part of the covenant with labouring servants, that they must be allowed tea for breakfast!——If this unwholesome weed is not in some degree prohibited by the government, nothing less can be expected, than that, in a few generations, the brave, robust, stout inhabitants of Great Britain shall be degenerated to the delicate effeminate stature of the diminutive people of China.

TEA was first used by the rich; and when that had flattened their spirits, and raked their stomachs by its rawness, a dram of brandy, or some agreeable distilled cordial, became, with many, an approved remedy. This might probably bring the poorer

poorer sort of people at first to dram-drinking; for they could not so well return to their labour with their fibres relaxed, and their spirits dejected. May it not be necessary to put a check upon the use of this depauperating liquor tea, since dram-drinking is now under some restrictions? It seems very reasonable, that the labouring people should either be allowed some cheap spirituous liquor after their tea, to take away the qualms it occasions, or else they should be abridged in the use of that which causes a craving after so necessary an aid and assistance. Yet I cannot confine the restraint I mention to the poorer sort only, because I am convinced that such poor hot sippings help to unman and enfeeble all ranks of people; and it is great pity that warm water, bewitched with this Indian poison, should ever have been exchanged for the stout beer and made-wines of Old England. In short, considering the number of tea-drinkers, it may be supposed that tea-drinking has been as detrimental to the community, as dram-drinking, snuff-taking, or alum in bread.

N^o X.

Observations upon the different Sorts of Teas, and the Methods of preparing them among the Chinese; with the Manner of adulterating them in Europe. How their good Effects may be improved, and their bad ones diminished.

TEAS are in general divided into two sorts, to wit, Green and Bohea.

THESE are differently denominated and known by subdivisions, according to the provinces or districts where they grow, the period of ripeness when gathered, the size
of

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of the leaf, or the method of curing; as hyfon, imperial, bloom, congo, finglo, fouchong, &c.

ALL Teas are the leaf of one and the same shrub; the supposition that Green is from one kind of tree, and Bohea from another, is a vulgar error.

THE leaves of the shrub called Tea, are, when immediately pulled from the tree, so extremely bitter as to yield an infusion that is very disagreeable to the taste; therefore to abate this unpleasing quality, the people who are appointed in China to prepare them for use, infuse them, soon after collecting, for a certain time in water, by which a portion of their bitter resinous particles being taken away, they become so mild as to be pleasant, and very engaging to the palate. After their being infused, they are dried in the following manner: the Bohea, which is made from the leaves when full ripe, and ready to fall from the tree spontaneously, being thus brought to a proper flavour by infusion, is immediately dried by the sun or fire, so that it may be preserved for use. Therefore as the tree or shrub which yielded it incurs no detriment from the leaves being pulled off, as they were in a deciduous state, this Tea can be afforded at a cheaper price than the Green; and this will account for the leaves of the Bohea being darker in colour, and smaller in breadth; because, being almost dry when they are collected, and then steeped in water, in curing they are higher dried, and so more contracted and crumpled than the Green Tea.

THE Green Tea, on the contrary, is pulled from the same shrub in a more violent way, just when the leaf is expanded to full maturity; whereby the tree which produces it suffers so much detriment, that two or three years of respite are allowed it to recover its pristine vigour; and the leaves it produces in those years of recovery, are collected when they fall, and prepared for the Bohea; on which account the Green
Tea

Tea is sold at a higher price than the Bohea, and the Bloom Tea is still much dearer than either of them. Green Tea also becomes dearer by a more expensive preparation; for as soon as it is reduced to a proper pitch of flavour by the previous infusion in water, it is immediately exposed to the warm rays of the sun, and carefully and assiduously turned and managed for a convenient time; after which, it is strewed upon broad sheets of copper laid upon embers, where it is rolled and turned by the hands of proper persons, who are armed with gloves of leather, to protect them from the mischief, to which they have found by experience that they are in this business exposed, by the metallick efflorescence, from which the Green Tea derives its more agreeable colour, and according to general but false estimation, its superior excellency over the Bohea. For in things of this sort, the delusion or infatuation is almost universal, which predominates among Asiatics and Europeans indiscriminately, and engages them to make the consideration of health subservient to the titillation of the palate, and the delight of the eye. Therefore the verdant beauty of this artificial colour is more alluring, and more esteemed though often pernicious, than the brown hue of the Bohea, which is prepared in a manner more consistent with the simplicity of nature, and the safety of health.

IN Europe, but more particularly in England and Holland, a frequent commercial intercourse with the eastern kingdoms has made this article to become, by its general use and custom, almost one of the necessaries of life: and therefore secrets in the art of manufacturing and preparing Teas being very well known amongst the tramping itinerant dealers, we may, from the general reputations of this species of mercantile strollers, and the proclivity to deceit, for which they are not a little notorious, without much difficulty solve the problem, how it can happen that these impostors are able to vend Teas of both sorts, which have already paid duty to the crown, at a price inferior to the duty? For being in contract with the servants in
coffee-

coffee-houses and places where large quantities of Tea are made, they buy at a very small price the tea-leaves which have been already used, which they re-manufacture very dexterously, and prepare again for sale, by drying, rolling up, and dying with certain pernicious drugs, whereby they give it the very smell and specious appearance of original good Tea to such nicety, as easily imposes upon incautious purchasers; and by its lower price, and the appearance of being smuggled, it very much pleases the saving ones. Several dealers have not long since been convicted of these execrable practices; therefore, as they are upon record, the truth of this remark cannot be disputed.

MAY we not then, without an insult upon probability, suppose that many of the mischiefs attributed to some latent malignant qualities in the Tea, are not occasioned by any natural insalutary properties in the vegetable itself, but merely caused by the methods and arts practised upon it, either here or in China?

Is not this supposition in some measure confirmed by the similar effects of taking a large quantity of strong Green Tea, and a very small quantity of the erugo of copper? Both excite vomitings, tremblings, &c.

Is not this supposition again corroborated by the innocence of the infusion of the Bohea Tea; which though taken very strong, and in large quantities, provided it be not very hot, yet is never known to be attended with such pernicious consequences as the Green Tea?

DOTH not drinking even Bohea Tea very hot frequently affect the nerves? though when taken but moderately warm, it is not only innocent but wholesome?

IF the Tea were in itself of a poisonous quality, would not the acuteness of the Chinese penetration have discovered it? Constitutions of such attenuated and sensible delicacy as theirs are,

are, would have suffered by it perhaps more than the robust Europeans are supposed to have done. Yet with that people it has always been in very high estimation, and greatly extolled for its salutariness; and amongst the Europeans some eminent physicians have supposed the Bohea Tea to be possessed of many excellent qualities as a restorative.

It may be proper here to observe, that we are assured from a gentleman of veracity, and who we dare say would not propagate a falsehood, who commanded an East-India ship several voyages to China, that the Chinese very rarely drink the Green Tea; and it is observed that those amongst them who do drink it to great excess, are often thrown thereby into a diabetes, or become tabid, and die emaciated. If with Tea a moderate quantity of bread, and a very little butter upon it be eaten, any noxious quality in the Tea, provided it should be the Green Tea, will by that mixture be considerably abated. But nothing, except what is of an highly virulent nature indeed, can be more pernicious, especially to delicate constitutions, than large draughts of Green Tea poured hot into the stomach, mingled with the additional relaxing property of a great deal of butter spread upon small pieces of bread; and I am sorry to find this preposterous custom too prevalent in this country for any consideration to justify. If therefore the infusion of foreign plants must be preferred to those made of the more salutary herbs which our own island produces, let it be that of the Bohea Tea; which, taken moderately cool, with bread not too much daubed with butter, will seldom be found to be attended with such dangerous consequences as have been perhaps too rashly attributed to Tea in general, though not altogether without reason to the Green sort in particular.

N° XI.

An Account of a remarkable Case in Surgery, from
Caton near Lancaster.

THOMAS WALKER, a child about six years of age, living at Caton, being asleep near the fire, a stone about half a hundred weight fell from the top of the chimney upon the side of his head, and fractured his skull in a most terrible manner. The poor boy lay as dead for several hours; but his parents being persuaded to carry him to Dr. Brachen of Lancaster, they immediately followed the advice. The doctor made a proper incision, in order to clear the skull from the pericranium, and discover the fracture; when he found the parietal bone fractured in twenty pieces (some as large as a shilling piece) with their sharp points sticking down in the brain; the dura and pia mater being both destroyed, and a considerable effusion of blood from the vessels of the brain.

THESE bones were removed with great care and dexterity; for as their points went so far into the brain, the nicety consisted in removing them so that the instrument might not pass too far into the substance of the brain, and consequently destroy the patient. In fine, the boy recovered beyond expectation, and is now entirely well, though it is three months since he received the hurt. Therefore the said Dr. Brachen inserts this for the information of those who are bigoted to an opinion, that if the brain was wounded till the lobe or particular part of the brain was rotted or consumed away, the case would be desperate.

IN this instance the dura and pia mater were both much shattered, and at length two drachms of the substance of the brain came away during the operation, besides what was afterwards cast out at the wound in times of dressing (which was

6 confi-

considerable) and all this without any very bad symptoms. Several credible persons were eye-witnesses to the truth of this relation.

Nº XII.

Extracts from Dr. Hunter's Medical Commentaries,
Part I.

In the First Chapter the Doctor gives the following Account of his injecting the Testis.

“ ABOUT the beginning of November 1752, in presence of Mr. Galhie and some others, I injected the vas deferens in the human body with mercury, and by that method filled the whole epididymis, and the tubes that come out from the body of the testis to form it; and observed in this operation, that the mercury continued to run, and the body of the testis to become gradually more turgid and heavy for some time after the external parts were completely filled. I believed we should find the internal tubuli likewise filled, but I would not venture to open it till I had got another, lest I should spoil what was already a valuable preparation, and desired my brother to lose no opportunity of making the trial.”

“ THIS was communicated as a piece of anatomical news to Dr. Donald Monro, then at Edinburgh, by a letter from Dr. Garrow, physician at Barnet, some time in the same month.”

“ IN some such time as a week or fortnight after this first public demonstration, my brother made the trial, and succeeded. He shewed me the testis opened, and the tubular internal substance very generally filled with mercury. This preparation,

paration, which I still preserve, I shewed at my public lecture that very evening, with marks of being pleased with the discovery. In my next course of lectures, viz. Feb. 1753, and in every course since that time, I have shewn the same, and some other preparations of the same kind; and always gave the history of the discovery, to avoid taking that share of it from my brother which belonged to him."

IN the second chapter Dr. Hunter gives an account of the origin and use of the lymphatic veins, in which, from the evidences of a great number of gentlemen who attended his lectures, he endeavours to prove that he was prior to Dr. Alexander Monro, jun in the opinion they both have concerning those veins; but Dr. Monro says, the discovery he has made with respect to the lymphatics, was owing to experiments ascertained four years ago. Now Dr. Hunter has read public lectures in anatomy eleven years, and in every course made the following observations on the lymphatic veins: that whereas the most generally received opinion was, that they were a continuation of lymphatic arteries; he, on the contrary, believed them to be the system of absorbing vessels, and that they began from all the internal and external surfaces of the body. This belief he founded on these reasons: every body allows, that all the surfaces of the body are bibulous, or provided with absorbent vessels, by which, mercury applied to the skin, collections of water in the breast, belly, or in the cellular membrane, &c. are occasionally taken up, conveyed into the circulation, and strained off again by secretion. That the lymphatic veins performed this office, seems probable, from the following remarks: I cannot inject them as other veins, by filling the arterial system; so that, in all probability, they are not continuations of the arteries. I have sometimes observed in injecting, that they were immediately filled with wax when the arteries burst, and the wax was effused into the cellular membrane; this looks as if they took their rise from those cells, like the veins in the spongy part of the penis. If they

they were continuations of arteries, why should they be so plentifully provided with valves, which are not found in the other veins of the viscera? But the most striking argument is the analogy between the lymphatics and lacteals; these two systems are, to all appearance, the same in their coats, in their valves, in their manner of ramifying, in their passage through the lymphatic or conglobate glands, and in their termination, viz. in the route of the chyle. As they are perfectly similar in every other respect, we must suppose them to be so in their origin and use. The lacteals are known to begin from the surface of the intestines, and to be the absorbents of those parts. There is no difference but the name. The same vessels are called lacteals in the intestines, and lymphatics in the other parts of the body. This doctrine explains the use of valves in the lymphatics. In other veins, whether large or small, the fluid is supposed to move onwards by an impetus received in the arterial system; but the case is not the same in vessels that suck up a fluid from a surface. These require valves, that every lateral pressure upon them may have the effect of an impulse at the beginning of the canal, in driving the fluid onwards towards their termination. This doctrine of the lymphatics is farther confirmed by the absorption and progress of the venereal poison. The lacteals were discovered, traced, and their use ascertained from the circumstance of a manifest and particular colour in their contents, upon some occasions at least. We have not the same advantage with respect to the lymphatics; but in them, what we cannot trace with the eye, we find out by the effects of this poison. We know from observations, that this virus may be taken in at any particular part of the body, and thence diffuse itself over the whole constitution. We must suppose it absorbed by the same vessels that absorb its antidote mercury, or any thing else that is carried into the mass of blood by absorption. These things being of a more inoffensive nature, pass unobserved; but this poison, from its irritating and destructive quality, is apt to raise disturbance in its passage, before it reaches far enough to mix

mix with the blood. Hence the lymphatic glands, through which every absorbed liquor must pass, are often the parts first affected by the venereal taint, when it is spreading its contagion through the constitution. This is the theory of the venereal bubo. If the infection be received in the most common way, the bubo happens in the groin, because the lymphatics of the genitals pass through the inguinal glands; but, if the infection be received at the hand (a case that sometimes occurs) the bubo, for the like reason, is formed in the armpit: when the disease is communicated by the lips, the glands of the neck inflame and tumify. This is the very essence of Dr. Monro's treatise; and these observations have been publicly made by Dr. Hunter to his pupils, for the space of eleven years, &c."

To this Dr. Hunter adds, "Ever since I first read anatomical lectures in 1757, among all other things a little out of the common way of thinking, I have advanced the doctrine of the lymphatics being the system of absorbing vessels, and have supported my opinion by such arguments and experiments as are mentioned before. This appears by the MS Syllabus of my lectures which I have, and from the beginning of many MSS in the hands of those who have studied with me, and by the general testimony of those who have done me that honour. I have many vouchers in my possession from gentlemen who have attended my lectures, and I appeal particularly to the following gentlemen, who are all professors or readers of anatomy, now living, Dr. Collingnon, professor of anatomy at Cambridge; Dr. Smith, reader of anatomy at Oxford; Mr. Hamilton, professor of anatomy at Glasgow; Mr. Cleghorn, reader of anatomy at Dublin; Mr. Watson, reader of anatomy in London; Mr. Galhie of London, and demonstrator or dissector for the professor of Cambridge. So that the fact of my having taught this doctrine, and supported it by such arguments, for a number of years at my public lecture, cannot, I think, admit of a dispute.

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CHAP. iv. contains remarks upon some extraordinary paragraphs in Dr. Monro's pamphlet, which are too severe and particular for us to insert.

DR. HUNTER, chap. cxi. gives a history of his dispute with Dr. Monro; and in the eleventh chap. he makes remarks upon some paragraphs in Dr. Monro's pamphlet, which the public may not think necessary to be here inserted; we rather choose to give his fifth chapter, which may be more entertaining and useful.

DR. Hunter's fifth chapter is upon the absorbent veins, in which he proceeds as follows :

DR. Monro has taken a great deal of pains to discredit me upon a variety of subjects, which he might have known I should not choose to dispute with him. Upon these occasions he misrepresents the facts, puts what words he thinks proper into my mouth, gives out opinions as mine, which he should have known to be not so; and then shews his parts and his reading in confuting them. He would have lost nothing had he disputed with more modesty, and learnt to bear what he thought a triumph with more moderation. We shall take his chapter, page 55, of absorption by the branches of the red veins, as an example of this sort of dealing with me. Pray, reader, stop here a few minutes, and consider that chapter carefully; it consists but of a few pages.

HE makes me assert that the red veins do not absorb, and then you see how he treats me, and triumphs. What foundation has he for making me the father of this hypothesis? He quotes the Critical Review. Look to the place, and you will find he refers to some notes written by the authors of the Critical Review; not to any work of mine. Now suppose I had written these notes, yet as they appeared under another name, and as he could not prove, or certainly know them to be mine, surely he had no right to use my name with the freedom

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dom he has done. A gentleman would not have done so for my sake; a man of sense would not have done so for his own sake. But the truth is, that I knew nothing of those notes, directly, or indirectly, till I read them in print; the authors of the Critical Review knew this to be true, and give me leave to say so in the strongest manner I please*. To shew Dr. Monro in his true colours, I must go farther still, and tell the reader that he must have known this was not an opinion or hypothesis that I maintained. He attended all my lectures; I appeal to all the MS notes of my lectures, and to all my pupils. Let them recollect or look into the second lecture; they will find that I say of veins, they begin, first, from arteries; secondly, from surfaces or cavities as absorbents: and when upon the mesenteric veins, they may remember I explained the common doctrine, and commonly produced the drawing of a little hydraulic machine of Dr. Lieberkuhn, by way of illustration; and that I went no farther in opposition to the common opinion, than to say that I was not satisfied, that I had doubts, that all my observations were against the common hypothesis, but that I did not take upon me to say it was not the truth.

INDEED, in both my courses of the winter 1759-60, I went so far as to say, I believed that the red veins did not absorb, and gave my reasons for thinking so; but this was long after Dr. Monro's publication.

IN different parts of my lectures, I used to treat of the transudation and absorption of fluids in animal bodies, in the following manner.

“ I HAVE often considered with my self how the interstitial fluid gets into the smaller and greater cavities of our bodies;

* The professor has been followed through so many mortifying situations, that it is high time to shew him some pity. The reader is therefore intreated to compassionate the distress which he must have been in, when he thought of quoting those notes in the Critical Review as my words, in order to make his defence; which he has done in six different places, viz. pag. 19. 37. 53. 56. 58 and 65.

“ how

" how the water of an anasarca, for instance, gets into the
 " cellular membrane. The common opinion, I think, is, that
 " there are every where exhalant arteries, which open and
 " terminate on the superficies of such cavities, and throw out
 " the watery fluid which they contain; but for my own part,
 " I cannot help believing that it is intirely by transfusion
 " through the coats or sides of the vessels; my reasons for
 " thinking so are these."

" FIRST, so far as I can find, all the arguments of the
 " latest and best anatomists, taken from injecting the arterial
 " system in dead and living bodies, only prove that a thin fluid
 " passes readily from the arteries into the interstices of parts.
 " They do not prove the existence of exhaling branches, no
 " more than they prove transfusion."

" IN the second place the phenomena of injection, so far as
 " I have been able to make observations, agree better with
 " the notion of transfusion, than with that of exhaling arte-
 " ries. I have had great experience of injections, and I have
 " made experiments with all sorts of fluids injected into the
 " arteries and veins of dead bodies. I have always observed
 " that subtil and penetrating fluids pass with ease from the
 " arteries into the cavity of the intestines, and into the cellu-
 " lar membrane, in any part of the body: such fluids are
 " water, gum-water, whites of eggs strained, glue, isinglass
 " dissolved in water or spirits, any fluid oil, melted butter, or
 " axunge, &c. But when these fluids were coloured with ver-
 " milion, I always observed that none of the vermilion passed
 " out of the arterial system, but when there were manifest
 " appearances of extravasation, and rupture of the vessels: I
 " never observed vermilion pass into the cavity of an intestine
 " from the mesenteric arteries, without seeing a hundred rup-
 " tures and extravasations in the villi of the gut. All this
 " looks as if the fluid oozed through the coats, rather than
 " was poured out by the branches of arteries.

“ IN the third place I have observed that the cellular membrane is not so immediately filled by injecting the arteries ; it requires some time ; and I have plainly seen, when I have let an injected part lie by a little while, that the cellular membrane became gradually more loaded, as the arterial system became more empty ; a strong argument, in my mind, that it got out of the arteries by transudation.

“ IN the fourth place, water and even red blood soaks through all our vessels and membranes in dead bodies, as you may see by steeping the apex of a heart well washed, or the convolution of a piece of fresh intestine in clear water ; in both cases the water will become bloody.”

“ BUT still it is said that in all these cases, the fluids pass by fine exhaling vessels, though these vessels cannot be seen. To this I answer, that if our interstitial fluid was of a strong marked colour, we should then, by dissection, be able to observe, whether it was poured out by small arteries, or whether it soaked through the natural pores in the coats of vessels. Now very fortunately for us in this dispute, there is one such fluid in the body ; it is the bile. Its colour is pretty deep, and very different from any thing that lies near the gall-bladder. No man can have opened any number of bodies, without allowing that the gall does pass, in living bodies, through all the coats of the gall-bladder ; and pervades the substance of the neighbouring parts, not by exhaling, nor by inhaling vessels, but by manifest transudation or soaking.

“ IT might be asked, Why the red blood does not transude through the vessels in living bodies ? for I think it certainly does not. In answer to this it may be said, that our fibres and vessels have perhaps some degree of tension and firmness in life, which they lose with life. And it must be observed too, that in proportion as the blood putrefies,
“ it

" it becomes thinner ; whence we see, in opening a putrid
 " body, all the cavities, more or less, filled with a bloody
 " water, and all distinction of colour in the muscles and cel-
 " lular membrane quite lost. But what I suppose to be the
 " principal reason that red blood does not transude through
 " the vessels in living bodies, is its glutinous quality, its thick-
 " ness while it is equally mixed up with its coagulating part.
 " That part coagulates as certainly as the blood stagnates,
 " even in living bodies ; and when the universal stagna-
 " tion happens in death, this part of the blood collects itself
 " into irregular polypi and coagulations all over the body ;
 " and the rest of the blood is no longer the thick viscid fluid
 " it was before, but rather a bloody serum, that will ooze
 " through all the vessels and membranes."

" SUCH were my notions of the source of our interstitial
 " fluid. With regard to its absorption, I was of opinion that
 " nature had provided a system on purpose, viz. the lymphatics.
 " I considered these vessels and the lacteals as an appendage
 " to the venal system, by which the stores were brought in for
 " supplying the circulation ; and the glands and secretory
 " vessels all over the body, I considered as an appendage to
 " the arterial system, by which the proper separations were
 " made, and the redundancies thrown off."

" MY only doubt was, Whether the veins did, or did not,
 " absorb a certain quantity, especially in the intestines ? For
 " my own observations on injections, I should have concluded
 " that they did not, and that there was no passage for liquors
 " between an intestine and the mesenteric veins, otherwise than
 " by transudation. But authors of the best credit had given
 " such arguments and experiments in favour of absorption by
 " veins, that I dared not, even in my own mind, determine
 " the question.

" AT this time my brother was deeply engaged in physio-
 " logical enquiries, in making experiments on living animals,
 " and in prosecuting comparative anatomy, with great accuracy
 " and application. It is well known that I speak of him with
 " moderation when I say so. He took the subject of absorption
 " into his consideration; and from all his observations, was in-
 " clined to believe, that in the human body there was one,
 " and but one system of vessels for absorption; he knew so
 " well that many things had been asserted by one person
 " after another, which were not true, that so many mistakes
 " had been made from inattention, so many errors introduced
 " from other causes, that he could easily suppose the veins might
 " not perhaps absorb, after all the demonstration that had been
 " given of the fact; and therefore was determined to see how
 " far this point could be cleared up by plain experiments and
 " observations. With that intention he made the following ex-
 " periments in my presence, and in presence of a number of
 " gentlemen, who all of us assisted him, and made our own ob-
 " servations upon what passed before us. I shall quote the expe-
 " riments from him, and can bear testimony to the fairness with
 " which they were made, and with which they are here related."

A N I M A L FIRST,

EXPERIMENT I.

ON the third day of November, 1758*, says he, " I open-
 " ed the belly of a living dog. The intestines rushed out
 " immediately; I exposed them fully, and we observed the
 " lacteals filled with a white liquor at the upper part of the
 " gut and mesentery; but in those which came from the ileon
 " and colon, the liquor was transparent.

" I TIED up the mesenteric artery and vein that was go-
 " ing to about half a foot of intestine, and put a tight liga-

* In presence of Drs. Clayton, Fordyce, Michaelson, and Mess. Blunt, Jones, Churchill, and Richardson.

" ture upon the upper part of the intestine, including a little
 " of the mesentery; then emptied that part of the gut by
 " squeezing it downwards, and put a similar ligature upon
 " the lower part of the gut. In the next place, I made a small
 " hole in the upper end of this part of the gut, and by a
 " funnel poured in some warm milk, and confined it, by
 " making a third ligature upon the gut close to this hole.
 " These ligatures prevented the circulation of blood in this
 " part of the bowel. Lastly, I punctured the vein beyond the
 " ligature that had been made upon the mesenteric vessels,
 " and by gentle stroaking with the end of the finger, soon
 " emptied it of its blood."

EXPERIMENT II.

" I IMMEDIATELY after this made the same experiment,
 " and in the same manner, on a part of the intestine lower
 " down, where the lacteals were filled with a transparent
 " liquor."

" IN the first experiment, the lacteals continued to be filled
 " with a milky or white fluid. In the second, the lacteals,
 " which before contained only a transparent lymph, were
 " presently filled with white milk. In both these experiments
 " we could not observe that the least white fluid had got into
 " the veins. After attending to these appearances a little
 " while, I put all the bowels into the abdomen for some time,
 " that the natural absorption might be assisted by the natural
 " warmth; then took out and examined attentively the two
 " parts of the gut and mesentery upon which the experiments
 " had been made; but the lacteals were still filled with milk,
 " and there was not the least appearance of a white fluid in
 " the veins; on the contrary, what little blood was in them,
 " was just as thick and as deep coloured as in the other veins,
 " and when squeezed out from them, coagulated as the blood
 " of other veins."

EXPERI-

EXPERIMENT III.

“ I TIED up and filled another piece of the intestine with
 “ milk in the same manner, but did not make a ligature upon
 “ the mesenteric vessels, leaving a free circulation in the part.
 “ We looked very attentively at the colour of the blood in the
 “ vein of that part, both with our naked eyes and with glasses.
 “ We compared it with that in the artery, and in the neigh-
 “ bouring-veins, but could not observe that it was lighter
 “ coloured, nor that it was milky, nor that there was any dif-
 “ ference whatever.”

EXPERIMENT IV.

“ LASTLY, We took that part of the gut which was filled
 “ with milk in the first or second experiment, and squeezed
 “ and pressed it very gradually, in order to see whether any
 “ milk would by these means pass into the empty mesenteric
 “ veins. This we did gradually with more and more force,
 “ till the gut at last burst; but still there was not the least
 “ appearance of any thing milky in the veins.”

ANIMAL SECOND.

EXPERIMENT I.

“ IN November 13, 1758*, I opened the abdomen of a
 “ living sheep, which had eat nothing for some days; and
 “ upon exposing the intestines and mesentery, we observed the
 “ lacteals were visible, but contained only a transparent wa-
 “ tery fluid. I made a hole in the intestine near the stomach,
 “ and by a funnel poured in some thin starch coloured with
 “ indigo, so as to fill several convolutions; then tied up the
 “ hole in the gut, and put all the bowels into the abdomen

* In presence of Doctors Wren, Fordyce, and Michaelson; and Messieurs
 Blount, Tickell, Churchill, Paterfon, and Skeette.

“ for

“ for some time. Upon taking them out after this, we observed all the lacteals of that part filled with a fluid of a fine blue colour. We thought at first that the blood in the veins of this part was of a darker colour, but upon comparing it carefully with that in the other veins, it was manifestly the same.”

EXPERIMENT II.

“ I OPENED a vein upon this part of the mesentery, and caught a table spoon full of its blood. I set it by to coagulate and separate into its coagulum and serum. On the next day and the day after I examined the colour of the serum, but it had not the least blueish cast.”

EXPERIMENT III.

“ I FIXED an injecting pipe in an artery of the mesentery, where the intestine was filled with the blue starch, and tied up all communications, both in the mesentery and intestine (as in animal first, experiment I.) but left the corresponding vein free; then I injected warm milk by the artery, till it returned by the vein, and continued doing so till all the blood was washed away, and the vein returned a bright white milk. This was done with a view of seeing if the milk in the vein acquired any blueish cast, but there was no perceptible difference between the arterial and venal milk.”

EXPERIMENT IV.

“ AFTER this I opened the vein with a lancet, and discharged most of the milk, then put a ligature upon both the artery and vein, and waited some time to see if they would fill; but they did not, nor did the remaining contents of the vein acquire the least blueish cast. Then I opened the gut at this part, but we could not observe any appearance

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“pearance of the milk having got into the cavity of the intestine.”

EXPERIMENT V.

“I FILLED another part of the intestine with milk; all that we observed after doing this, was, that the lacteals became fuller, though not of a white colour; and the veins remained of the same complexion.”

EXPERIMENT VI.

“I FIXED a pipe into a vein of the mesentery, and injected milk towards the intestine, to see if any would pass into the cavity of the gut; but presently innumerable extravasations happened, so that the experiment was fruitless.”

EXPERIMENT VII.

“I FIXED a pipe into an artery, and tied up the vein and all the communications; then injected milk for some time into the artery, till the vein became quite turgid and tight. This was continued for some little time, and with as much force as we thought the vessels would bear without bursting; then we opened the intestine at that part, and there was no appearance of milk in its cavity.”

EXPERIMENT VIII.

“I TOOK a piece of the intestine that was quite empty and clean, and filled it with warm water. The returning blood in the vein of this part appeared not at all diluted, or thinner than in the other veins; then I tied up the artery, and all the communications, and attended to the state of the vein for some time. It did not grow more turgid, nor did its blood become more watery, nor was there any appearance whatever of the water's having got into the veins. The animal was quite alive all the time of our making these
“expe-

“ experiments and observations, which lasted from one o’clock
 “ till half an hour after three. I chose a sheep rather than a
 “ dog, both because the animal was much larger, and there-
 “ fore its mesenteric vessels were fitter for being easily in-
 “ jected, and besides, because it is much more patient and
 “ quiet. These advantages we were all sensible of when we
 “ made the experiments.”

A N I M A L THIRD.

JUNE 22d, 1759, “ We repeated most of these experi-
 “ ments on another sheep, to see if the effect would be the
 “ same; but in this animal the viscera were diseased, inflamed,
 “ and thickened in most parts; so that the experiments were
 “ much less successful, less satisfactory, and conclusive. After
 “ injecting milk into the mesenteric artery for some time,
 “ and allowing it to return by the vein, we opened that part
 “ of the intestine which had been previously emptied, and
 “ found in it a watery fluid of a whitish cast, as if a few
 “ drops of milk had been mixed with it.”

A N I M A L FOURTH.

“ IN July 1759*, I repeated most of the experiments re-
 “ lated in article animal second, upon another sheep. The
 “ effect of all of them was so nearly the same, that I need not
 “ be particular.”

“ I SHALL only observe, that when the intestine was filled
 “ with starch-water and indigo, and milk injected by the
 “ artery till the vein was washed clean of blood, and a liga-
 “ ture put upon the artery and vein, so as to leave them about
 “ half full of pure white milk; after waiting more than half
 “ an hour, we could not observe that the vein was in the least

* In presence of Doctors Macaulay, Ramsay, and Michaelson; and Mess.
 Edwards and Tomlinson.

“ more filled or turgid, nor had the milk in the veins acquired
 “ the least of a blueish cast, not even in the small veins upon
 “ the gut itself, where we should suppose the absorbed liquor
 “ must have been apparent, if any had been taken up by the
 “ veins from the cavity of the intestine. After the animal
 “ was dead, I blowed into a mesenteric vein, and the air
 “ found a passage into the cavity of the gut; though in mak-
 “ king the experiment when the animal was alive, I could
 “ not force the milk by injection from the vein into the gut.”

ANIMAL FIFTH.

“ IF any animal could be supposed a fitter subject for such
 “ experiments than a sheep, it would be an ass: he is not so
 “ large nor so strong, but that he may be managed; he is
 “ patient in the greatest degree. His mesentery and vessels be-
 “ ing larger, it is so much more easy to fix injecting pipes,
 “ make ligatures, &c. and, what is a very great advantage in
 “ making such experiments, his mesentery is very thin and
 “ without fat, so that the vessels are conspicuous and distinct:
 “ hence it is very easy to separate the artery from the vein,
 “ to fix pipes, to tie up anastomosing vessels by a needle, &c.”

“ THEREFORE I got an ass, and on the * 24th of August
 “ 1759 put him upon his back in an open garden, and tied
 “ him fast to four stakes drove into the ground, then opened
 “ his abdomen, &c.”

EXPERIMENT I.

“ I POURED a solution of musk in warm water into a piece
 “ of the intestine, and confined it there by two ligatures; in
 “ doing this the animal struggled, and a little of the liquor
 “ was spilt upon the outside of the intestine and mesentery.”

* In presence of Doctors Macaulay and Michaelson, and of Mess. Edwards, White, and Gee.

“ AFTER

“ AFTER waiting a little while, I opened with a lancet
 “ some lacteals of this part, which were full of a watery fluid,
 “ and caught a little of their contents in a small spoon: it
 “ smelled strongly of the musk; and though it could hardly
 “ be doubted that the musk had been taken up from the intest-
 “ tine by absorption, yet, as some of the musk solution had
 “ been spilt upon the external surface of the parts, and as it
 “ was impossible to collect the lymph from the lacteals with-
 “ out resting the edge of the spoon upon the mesentery, the
 “ smell of the spoon might be owing to that circumstance.”

“ AFTER this I wiped a vein upon the mesentery very
 “ clean, and opened it with a lancet: a gentleman who had
 “ kept out of the way of the musk, came immediately with
 “ a clean spoon, and filled it from the stream of blood with-
 “ out touching any part of the animal, and carried it directly
 “ off; but it had not the least smell of musk.”

EXPERIMENT II.

“ WE poured some starch-water, made very blue with in-
 “ digo, into a part of the gut, in the same manner as in
 “ some of the former experiments, tied the vein and artery
 “ of this part, then punctured the vein close to the ligature,
 “ and pressed out almost all the blood, then tied up the empty
 “ vein, and put all into the cavity of the belly for a quarter
 “ of an hour; after that we examined the part, found the
 “ lymphatics very turgid, as the fluid could not pass through
 “ them towards the thoracic duct, on account of the ligatures
 “ made upon the mesenteric vessels; but we found the veins
 “ of this part empty, except indeed that a little blood had
 “ got into them from the neighbouring vessels, which, from
 “ the appearance, had evidently passed the ligatures tied
 “ round the ends of the gut; a circumstance which it is very
 “ difficult to obviate.”

EXPERIMENT III.

" I NEXT repeated the third experiment of animal second
" exactly in the same manner, and precisely with the same
" effect."

EXPERIMENT IV.

" THEN I repeated the fourth experiment of animal second,
" and the effect was still the same."

" N. B. It may not be amiss to observe, that the lacteals
" continued to absorb the blueish liquor all this time,
" even at the part upon which this fourth experiment
" was made, where the nerves must necessarily have
" been tied up with the artery."

EXPERIMENT V.

" I SQUEEZED a piece of the intestine so as to empty it as
" intirely as well might be; then tied up all the lateral com-
" munications of the vessels, and injected warm milk into the
" mesenteric vein till it returned by the artery, and continued
" this operation for some time after all the blood was washed
" out; then I opened that part of the intestine through its
" whole length, and found it quite empty."

" I MADE this experiment again upon another part of the
" intestine in the same manner, and exactly with the same
" success."

HERE is a new doctrine proposed in physiology, viz. that
the red veins do not absorb in the human body. The fair in-
quirer after truth will be convinced only by the observations
which occurred to me, that the common opinion is supported
by some proofs that are at least doubtful or equivocal; and that
the other opinion is not without plausibility; and he must al-

low that my brother's experiments render it highly probable. But we may presume, from what Dr. Monro has argued upon the doctrine of the lymphatics, that he will say, I had no right to set up this hypothesis, except I could refute, or otherwise explain, the experiments and arguments of the best and latest physiologists in support of the common opinion. I will therefore shew how little Dr. Monro has been able, with all the assistance which he may have had, to establish the old opinion, or to disprove the other,

THE first thing that he urges, p. 56, is an inconsistency between two expressions which he is pleased to call mine. My answer is, that I wrote one of them, and the authors of the Critical Review wrote the other; yet there appears to me no inconsistency: for if it were supposed that no small veins do begin, as absorbents, from the cavity of the intestines, &c. may not veins, as instruments of the circulation, begin from the cells of the penis? And though the chyle or lymph could not well pass through the absorbent system without valves and lateral pressure, may not blood return easily by the veins where there are cells between the terminations of the artery and beginnings of the vein? With regard to the motion of the contained fluid, these cells are to be considered as enlargements of the canal, as something of an intermediate nature between an aneurism and a varix; so that the blood is pressed from the cell into the vein with the same force with which it is thrown from the artery into the cell: hence it is that the penis remains in a state of systole so long as the resistance to the venal stream does not overcome the natural contraction of the part; but as soon as it does, the extension or diastole of the part necessarily ensues, and must continue as long as that resistance is continued.

I SHALL prove this by an experiment which my brother made upon a living dog, and which I shall give in his own words: "In April 1760 (says he) in presence of Mess. Blount, &c. I laid bare the penis of a dog almost through
" its

" its whole length, traced the two veins that come from the
 " glans, which in this animal makes the largest part of the
 " penis, and separated them from the arteries by dissection,
 " that I might be able to compress them at pleasure without
 " affecting the arteries: then I compressed the two veins, and
 " found that the glans and large bulb became full and ex-
 " tended; I then irritated the veins, in order to see if there
 " was any power of contraction in them which might occa-
 " sionally stop the return of the blood, but could not ob-
 " serve any such appearance; then I pricked the erec-
 " tor penis, upon which they contracted; but their contraction
 " had no sensible effect upon the veins, nor upon the penis."

DR. MONRO'S next argument, p. 57, is such as can have no weight against the new hypothesis. It is a long chain of premises, each of which may or may not be true; and at last there is a conclusion which is very agreeable to our hypothesis, and a presumption about a point that is not in question. It runs thus. Lacteals have not been certainly observed in oviparous animals: and yet, God knows, they may have them.—Dr. Monro is convinced, they have not lymphatic vessels, and we all know he may be mistaken.—Therefore in them the red veins absorb, or something else does it.—But as we cannot observe, that in them the veins differ in structure from the sanguineous veins in men, and yet it must be granted they many differ; and no body has yet proved whether they do or not; hence, true or false, right or wrong (according to the professor's logic) it is not necessary that absorbent vessels should have the valvular structure of the lymphatics. No surely, Capillary vessels, for instance, will absorb without valves; but vessels like the lymphatics or lacteals, that are not only to absorb but to convey fluids a considerable way, unassisted by gravitation, require valves or something that shall have the same effect; such as the muscular peristaltic motion of the great tracheal vessel that goes from the mouth to the anus. And it is also to be presumed, says our author, that the structure

ture of the branches of the red veins in men is such as renders them capable of absorbing. We, on the other hand, presume, that, if they were capable of doing it, they would actually do it; which does not appear to be the case: and we presume, if these small branches do not open into the cavities, that they may not be so capable of doing it.

OUR author's next argument (page 57 and 58) is drawn from the allowed absorption of the placenta. — " Yet (says he) whatever diligence I have employed here, in search of lymphatic vessels, has proved as fruitless as the labour of others had done; it remains then to Dr. Hunter to prove the existence of valvular lymphatic vessels in the placenta: or, by allowing that the branches of the umbilical, that is, of the red veins, do absorb, to retract such crude notions; which betray a want of due reflection, even on a subject about which the doctor is daily occupied." Surely, notwithstanding all the professor's diligence, there may be ten thousand short lymphatics in the placenta, terminating in the branches of the vein. Supposing there were, must the professor have seen them? Perhaps not, with all his diligence.

NOW let us consider his more direct proofs. (Page 58.) " Fluids (says he) injected from the trunks into the branches of the veins sweat out upon the surface of the skin, and into the different cavities of the body: which evidently shews, that many of their branches begin from these, and hence must be inherent." Here is an assertion and an inference. The assertion consists of two parts, which must be considered separately. Fluids injected into the veins sweat out upon the surface of the skin. Dr. Haller says no such thing in the place referred to*: and Kaau Boerhaave says nothing like it in his

3d,

* See the elegant treatise of Kaau Boerhaave De Perspiratione, or Element. Physiolog. of the illustrious Dr. Haller, lib. ii. S. 2. § 22, 23, 24.

3d, 4th, and 5th Chapters, where he professedly treats of the cutaneous discharges; and therefore we presume he nowhere says so. We will venture to say the assertion is not true; and that the professor will find it to be without any foundation, if ever he shall make a fair trial. This assertion then of the professor cannot be allowed to have any weight; nor can we allow much to what he says in the following. (Page 59.) In such trials as I have made, fluids get more readily into the cavity of the guts from the veins than from the arteries, and this ready outlet into the cavity of the guts, &c. The professor does not seem to have practised injections with sufficient dexterity and circumspection, without which they will often mislead us egregiously. In such trials as he made, injections passed more readily, &c. Why? In plain English, because they sooner burst; which gives a ready outlet enough. By such trials he may find a ready outlet from the right auricle of the heart into the cavity of the pericardium, and from the large vessels of the brain into its ventricles, and several others which no anatomist ever yet dreamed of. That our author's trials were frequently such, appears too from what he says in page 23. viz. In injecting the arteries indeed, for ex-

On the contrary, all he says there of the cutaneous veins is this, "*Inhalationem, five humoris per cutem resorptionem, proprio loco ostendimus;*" and then in a note desires us, in the mean time, to consult his commentary on Boerhaave, tom. iii. n. 416. where no such experiment is mentioned; but in the following, n. 417. after speaking of the arteries which may be demonstrated by injections to terminate on the surface of the skin, he says, "*De venis experimentum non novi ob valvulas, sed analogia demonstrat esse quæ respondeant arteriis.*" So that to prove an anatomical experiment, our professor quotes Baron Haller, who says he knows no such experiment. Please to observe I speak here of an anatomical fact, not of an opinion. It is Baron Haller's and every body's opinion, that inhaling veins begin from the surface of the body; and accordingly in another part of his writings, *Præp. Lin. § 444.* he says, "*Demonstrat hæc venas injectio anatomica, quæ per venas perinde ut per arterias exsudat, si aquosa, &c. tenuis fuerit;*" and what that exsudatio per arterias is, he tells us § 435, &c. "*Guttulæ sub epidermide effusæ quæ hanc in vesicæ elivant.*" But if Dr. Monro had found out these two passages in Haller, they would not have answered his purpose, except he could have proved that blistering was the same thing as sweating.

ample,

ample, the mesenteric, I had often observed, that the injected matter passed more readily by the lateral branches into the cavity of the guts, than into the corresponding veins. From all which those who are much conversant in injections must see how he was going on.

The passage of fluids from one vessel or cavity into another, must not always be taken as a proof that they have natural communications. Experiments of this kind made with water, air, or quicksilver, are particularly unsatisfactory. Water transudes readily through perhaps all parts of the human body, except the cuticle; and air and mercury are very apt to produce ruptures in the vessels, long before they have run into such minute branches as are easily filled with glue, &c. even when coloured with the powder of vermilion. Hence we see, that in the dead body air blown into the trachæa not only readily passes into the pulmonary vein, but finds a ready outlet at a thousand places through the external coat of the lungs. Any of the above-mentioned fluids readily pass from the emulgent vein into the ureter: and mercurial injections into the arteries and veins of most parts of the body, produce rupture and extravasation, long before such minute branches, as we can easily inject by other means, are filled. This is not owing to the want of fluidity in the mercury, but probably to the strong attraction among its parts, which resists its being drawn out into fine threads; and hence it runs so well through the excretory system of the testis, where the coats of the tubes are so much thicker and stronger*.

FROM

* Anatomical injections have certainly improved physiology, and yet they have sometimes led anatomists into great blunders. From the simplicity of the art of injecting, any man who can fix a pipe and melt wax, may set about experiments of that kind, and draw conclusions about the delicate and complex operations in the living body from the event of a blundering experiment made upon a dead one. If his wax breaks through the vessels at any part, it will be a direct proof that there was a natural passage, and if by escaping at this ready

FROM what has been now said, and from what was advanced upon the subject of transfusion in the former part of this chapter, and from my brother's experiments, the reader must judge of the experiments which Dr. Monro has quoted, as authorities against the doctrine which I have been proving and defending. I grant, that he has produced some of the

outlet it does not run into the smaller vessels, it proves clearly that no such small vessels exist, and that those anatomists who have seen them, and who have injected them, must have mistaken one thing for another. Our young professor is one of those who make bold injections and bold conclusions: his father has the same pretensions to injections, and has the same knack of going on in the argument, whether the wax stops or runs; I shall give a specimen. He twice in a bitch injected the uterine vessels with mercury, and found that he had not thereby filled any vessels in the placenta. (See Med. Essays, Edit. 1752, vol. ii. p. 130). Thence he concludes that in that animal the uterine vessels do not ramify through the placenta; and yet I find it as easy to prove by injections that they do, as that the mesenteric vessels go into the coats of the intestines. Having in this way established his supposition that the uterine vessels do not, in the human subject, pass into the placenta and chorion, he afterwards found it would be necessary, in support of his opinion, to take off Noortwyk's authority (ibid. p. 118); and therefore tells us that Noortwyk must have made a mistake, and is persuaded he will alter his opinion when the mistake is pointed out to him; and what is still better, concludes that Noortwyk has afforded him a very pretty proof of there being no anastomosis between the vessels of the uterus and secundines. Professor Monro would only have you suppose that Dr. Noortwyk had mistaken the uterus for the placenta and membranes; and in order to give his argument some plausibility, he has egregiously misrepresented the doctor by substituting one word for another of a quite different meaning in two of his quotations, and in a third has coined a whole sentence for him, &c. &c. Now the fact is, that Noortwyk was not mistaken, and is, we may presume, of the same opinion still, as it is impossible he should not believe his own eyes: I have seen his preparation, and can vouch for the truth of the greatest part of what he advances, not only from having seen that preparation, and from having conversed with him upon the subject, but from my own experiments and observations on the human uterus, and those often repeated.

I went into this digression to shew a little of the genius of our two professors; to shew their easy and dictatorial way of writing under a weight of distressing circumstances. It was for such a spirit in Dr. Monro's whole pamphlet that I despised it; and it was such a dictatorial style, and such a parade of appealing boldly to facts, that made my friends think that the performance might impose upon some unexperienced readers.

greatest

greatest names in anatomy : but it is an argument that may be brought against every new doctrine, and will have little weight when put into the scale against facts.

[To be continued in our next.]

Nº XIII.

Remarkable Worms discharged by Vomiting.

[From the Philosophical Transactions, Nº 117.]

A GIRL in Sheffield, about eight months old, was taken with violent vomitings, which continued for about a week, and made her so feeble, that her parents began to despair of her recovery : upon giving her about a pint * of wormwood-ale, she vomited three hexapods, or six-footed animals, they were all very active and nimble. See plate I. fig. 4.

As to the vomiting of worms, Dr. Lister observes, that a boy of nine years of age was afflicted with great pain in his stomach and continual vomitings ; upon giving him a powder wherein was a small quantity of mercurius dulcis, he vomited up several odd worms, which were perfect caterpillars, with fourteen feet ; something more than an inch in length, and of the thickness of a duck's quill, with thin hair, or rather naked, with brown wings and a black head ; and he thinks they would in time, if the place did not hinder, become chrysalides, and be changed into moths.

* This seems to be a very large dose for an infant of eight months old.

N^o XIV.

An Account of the Case of a Young Man stupefied by the Smoke of Sea-coal. By Dr. Frewen of Suffex.

[From the Philosophical Transactions. Vol. LII. Part 2.]

WILLIAM Colebrook, a lad of seventeen years of age, was left alone to take care of his master's vessel in Rye harbour, the 4th of June 1761; and shutting up all close at nine o'clock in the evening, he laid himself down to sleep in a small cabin, where there had been a sea-coal fire, which was not properly extinguished; and the chimney place being stopped, it soon grew full of smoke, the effect of which, when the people came on board next morning, proved to have been so powerful, as to render him totally deprived of all the sensible motions of the body, excepting those of the heart and lungs. The cause of this stupor being presently suspected, he was brought out upon the deck, in hopes the fresh air would prove of service; but neither that, nor bleeding, blistering, or any other applications they made use of, assisted him in the least, under this torpid situation. Being brought home to his master's house, about noon I visited him, and found him in the same soporous, apoplectic state, with a feeble pulse, respiration laboured and difficult, a rattling in his throat, and utterly void of all sensation. He appeared much like one I had seen, who had taken an over dose of opium, and died of it.

I STRONGLY recommended the plunging this patient into a cold bath; which being complied with, and done as expeditiously as it could be, was attended with a success even beyond my expectations. Immediately upon the immersion (for I ordered but only one plunge, supposing that a second would prove less efficacious, by weakening the power of the first) he opened his eyes and mouth, and shut them again. He was then instantly put to bed naked between the blankets; and in a very few minutes time, a great and universal sweat came

on him, which continued for many hours. In the evening he was first perceived to move a little, seemingly as if disturbed by the roughness of the blankets stimulating his skin: a while after he opened his eyes, and looked a little about him, in a confused manner. Some time after that, he grew more sensible, and spoke, but could only give the short answers, yes and no. His respiration was still difficult, and very laborious; but his pulse was stronger and fuller; on which account I ordered a little blood to be taken away; and he took frequently, a very little at a time, of some sweet oil. For his ordinary drink, I directed boiling water poured upon bread, with a little white wine, lemon juice, and sugar; of which, at first, he took but very little at a time, and afterwards more in quantity, as he could get it down.

THE next day I found him much better, when he sat up, talked, and drank some tea. His breathing was easier, but he complained of a short troublesome cough and hoarseness, for which I ordered him a smooth pectoral linctus; and a lenient purging draught was also given him, which had the desired effect. He continued growing better for a day or two, when I called upon him again, and finding his cough and hoarseness still remain, with a little shortness of breath, I directed him pills of millipedes and gum ammoniac, made up with bal. sulph. to be taken twice a day, drinking warm milk after them; by which means he grew perfectly well, and went to sea in twelve days.

N^o XV.

Regimen prescribed by Professors Boerhaave and
Osterdyke for the Gout.

THEY are of opinion that the Gout is not to be cured by any other means but a milk-diet, which will in twelve-months time alter the whole mass of blood; and in order thereto the following directions must be strictly observed and followed:

I. You

I. You must not taste any liquor, only a mixture of one-third milk and two-thirds water; your milk as new as you can get, and so drink it as often as you have occasion for it, without adding any other to it: a little tea and coffee is likewise permitted with milk.

II. In a morning, as soon as awake, and the stomach has made a digestion, you must drink eight ounces of spring water and fast two hours after; then eat milk and bread, milk pottage, or tea with milk, with a little bread and fresh butter.

III. At dinner you must not eat any thing but what is made of barley, oats, rice, or millet-seed, carrots, potatoes, turnips, spinnage, beans, pease, &c. you may likewise eat fruit when full ripe, baked pears or apples, apple dumplings, but above all milk and biscuit is very good; but nothing salt or sour, not even a Seville orange.

IV. At supper you must eat nothing but milk and bread.

V. It is necessary to go to bed betimes, even before nine o'clock, to accustom yourself to sleep much, and use yourself to it.

VI. EVERY morning before you rise to have your feet, legs, arms, and hands well rubbed with pieces of woollen cloth for half an hour, and the same going to bed.—This article must be strictly observed; for by these means the humours, knobs, and bunches will be dissipated, and prevent their fixing in the joints, by which they become useless.

VII. You must accustom yourself to exercise, as riding on horseback, which is best, or in a coach, chaise, &c. the more the better; but take care of the cold weather, winds, and rain.

LASTLY, In case a fit of the Gout should return and be violent, which they are of opinion will not, then a little dose of opium or laudanum may be taken to compose you; but no oftener than necessity requires. They are of opinion that your father or mother having the gout is of no consequence, if you will, under the care of a prudent physician, resolve to follow the foregoing directions.

N^o XVI.

Literary and Medical Intelligence.

[From the Memoires de Treveaux.]

OPUSCULES Chymiques de M. Marggraff, &c. or, A Chemical Work by Mr. Marggraff of the Academy of Sciences at Berlin, 2 vol. in 12mo. Printed at Paris, and sold by Vincent, 1762.—The fourteenth dissertation in this collection, which is placed at the beginning of the second volume, is a chemical examination of water, taken from vol. vii. of the Memoirs of the Academy of Sciences of Berlin for the year 1751, p. 131—138.

To give a clear idea of the different sorts of water which are the least mixed with heterogeneous particles, M. Marggraff has related the experiments which he made upon rain-water, and that obtained from snow. These waters received immediately from the clouds in proper vessels of glass, carefully secured from the admixture of any foreign matters, were the objects of his first examination.—After he had collected an hundred pints of rain-water, eight or nine of them were submitted to a gentle distillation, until all, except about two pints, were drawn off by a retort and sand-heat; then he poured on fresh water, until he had drawn off the whole quantity which he had provided.

THE three last pints, to which the whole quantity was reduced, was turbid, and manifestly charged with terrestrious particles, which he found mingled with it. This process was performed in small vessels, and the farther it was advanced, the more the fluid was charged; finally, when it was perfectly evaporated, the residuum appeared in the form of a white powder, inclining to yellow, and very subtil, which, in its consistence and qualities, perfectly resembled a true calcareous earth.

M.

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M. MARGGRAFF supposes that there is in rain-water a subtil acid, which would have dissolved that calcarious earth; and soon afterwards his experiments shew the truth of his conjecture. Having evaporated a part of this water which he had filtrated, he put into it twenty or thirty drops of a very pure solution of salt of tartar; he set it to chrystalize, and having let it stand for some time, he obtained from it a true salt, resembling small spiculations of nitre; and at length he even gained some cubical chrystals, not unlike to the common culinary salt: these two salts, which only weighed a very few grains, were of a brown colour, which was a manifest proof of their containing some oleaginous and viscous particles.

THE acid of common salt appeared clearly to be therein contained, by the effects it had upon the solutions of metalline bodies.

THIS liquor, after being filtered and successively mixed with a solution of silver, or with that of mercury or lead made with the acid of nitre, produced a white precipitate at the bottom; which precipitation succeeded much more fully with the silver than with other solutions. It is however to be observed that the metalline solutions for making this experiment must be taken in very small quantity, and diluted with a good deal of concentrated rain-water, or else the precipitation will be so little as hardly to appear to the eye, because of the small quantity of saline acid contained in this rain-water.

THE difference between rain-water and that of melted snow, is but very small; the first containing an acid that is more of the nitrous kind, and its particles of a calcarious earth; the salt of the latter is more of the marine acid: both, when exposed to putrefaction in the warmth of the sun, manifest alike their heterogeneous particles, and both produce the same effects from metalline solutions.

BORRICHIVS, in his book upon the knowledge of the Egyptian Hermes, p. 307, assures us, that the purest rain-water, even when ten times distilled, leaves still a fixed insipid earth; but he neither mentions the weight nor the nature of this residuum. Mr. Marggraff, as a more exact observer, hath discovered that out of two pints of rain-water, after a repeated distillation of twelve times, no more than nine or ten grains of terrestrious matter could be obtained, which he shews by two or three experiments to be of a calcarious kind.

BOERHAAVE thinks this residuum to be nothing else but merely the dust of the laboratory flying about and collecting therein; with this opinion Mr. Marggraff does not coincide; he says, that if it were only the effects of dust from the laboratory, then the residuum could not possibly be white, or even of a grey colour, but would rather be perfectly black, since the most part of that dust arises from the heaps of charcoal piled near the furnace.

OF other experiments made by Mr. Marggraff upon the water of several wells or springs in Berlin and its neighbourhood, it may be sufficient to mention only his reflections upon those experiments. The hydrometer alone will indeed discover the specific gravity or lightness of water; but it cannot shew to any degree of certainty the quantity of earth and salt contained therein, much less can it determine the nature and properties of those heterogeneous particles. With regard to chymical experiments, as far as they serve to prove the nature of water, either with oil of tartar per deliquium, or with metalline solutions, they are indeed very proper to shew what particles are contained therein; but this may not extend to every sort. It is still less the object of these operations to exhibit the quantity of each heterogenous matter contained in the water. They only give a surmise about its quality, and how far the water agrees with metalline solutions and other liquors of that kind: no certain consequences can be deduced therefrom but such as

relate to some of these matters ; what relate to others, remain undiscovered. Mr. Marggraff therefore recommends the manner which he has adopted for discovering the properties of rain and snow-water ; which consists, as shewn above, in repeated distillations and evaporations ; after which every one has it in his power to examine, as he has done, the nature of these heterogeneous particles, by combining them with various chymical solutions.

THE dissertation we have now mentioned, is followed by a memoir upon the inner red and odoriferous part of the cedar. This tree is called *Abies foliis fasciculatus acuminatis Linnæi* : *Laris orientalis*, fructu rotundiori obtuso, *Tournefortii* : *Cedrus Hebræorum Libani*, & *Palestinæ præcelso Adamii Lobellii* : *Cedrus conifera foliis laricis*, *Casparis Bauhini*.

THIS tree grows upon the mountains of Taurus, Libanus, and Amanus, and more abundantly in the kingdom of Congo. It is likewise found in the islands of Tercera in New Spain, in Virginia, and Florida. The inward part of its wood, by distillation with water, yielded an essential oil of a thick substance, inclining to yellow, oftentimes of a deeper colour, and in smell like to the cedar : this oil dissolves easily in a highly rectified spirit of wine ; it thickens in a moderate degree of cold ; by the increase of which it condenses to such a substance as to adhere to the bottom of the inverted vial without dropping. Besides this oil, Mr. Marggraff has obtained from cedar-wood an aqueous extract or gum, of an agreeable smell, upon the surface of which some chrystals of marine salt have collected themselves ; after which has followed a resinous clear substance, of a very fine balsamic smell.

THE sixteenth dissertation contains experiments on the regeneration of alum out of its own earth, by means of the vitriolic acid : he shews also some artificial compositions of alum, by means of uniting other earths with this acid. Those who are but little versed in chymistry, will allow that alum is
a ter-

a terrestrious salt, composed of the acid of vitriol, and of an earth; but of what nature is that earth and from whence doth the vitriolic acid attract that earth, in such a manner as to produce from it this kind of salt, is a question upon which the chymists are not yet agreed.

THE celebrated Stahl (see specim. Becher. part II. Experim. 107. p. 269.) believes this earth of alum to be a kind of chalk. He pretends in his treatise of salts (p. 121.) that a mixture of chalk with the acid of vitriol produces a sort of alum: this opinion is further established in other parts of his work, (ibid. p. 51. see p. 120.) He mentions (ibid. p. 121.) a curious experiment concerning a tube of clay, which having been used for distilling spirit of vitriol, crumbled to pieces on being exposed to the open air, and yielded afterwards, by elixation, a real alum.

In the treatise on salts (p. 305.) he mentions again the same opinion of Stahl. Mr. Neuman adopts the notion in his book, (tom. I. p. 126. see Juncher's chymistry, part I. p. 273. the Latin edition.)

MR. Pott, in his Lithogenesia (p. 32. and 9. in the first continuation of that treatise) says, that though it has been commonly believed that the earth of alum is a calcarious and chalky or stony earth, dissolved in a vitriolic acid, yet nobody has yet been able to make alum out of such earth. The same chymist (p. 31.) gives us an experiment, in which he has obtained crystals of real alum, by distilling the oil of vitriol with clay, and then dissolving the residuum in water, and setting the solution to crystalize.

To follow therefore a sure way between such different opinions, M. Marggraff formed a design to regenerate alum out of the earth from which it had before been separated. In his first essay he mixed this light and friable earth of alum with oil of vitriol diluted with three parts of water: this attempt did

not produce the desired effect; he had no better success with the calcined earth of alum mixed with the oil of vitriol; neither did the operation with clay alone produce a real alum. But at last, by adding an alkali to the crystals made from the earth of alum, or from clay, with the acid of vitriol, he obtained his desire. He does not believe that the alkali makes any part in the composition of alum, particularly when it is dissolved a second time, in order to crystallize it again: he rather thinks this alkali serves partly to destroy a certain quantity of a light greasy matter, inherent in the lixivium of alum, and serves chiefly to neutralize the acid which superabounds in the lye. From whence it happens that this alum, as a real neutral salt, contains neither too much nor too little acid, which renders it the more proper to congeal easily, and quickly to shoot into crystals. The experiments made upon white bole and upon white Spanish chalk have always proved fruitless; from which it follows, that Mr. Pott's opinion concerning the composition of alum is better grounded than that of Stahl and of Neuman.

WE shall not enlarge on the 17th, 18th, and 19th dissertations, the two first of which give a farther account of the prosecution of his experiments on the earth of alum; and the latter is a strenuous contest against the opinion of the great Boerhaave, concerning the dust flying in the laboratory as the cause of those terrestrious particles said above to be found in the distilled water.

WE shall pass over the 20th, which mentions some new chymical processes made upon tin. Mr. Marggraff formerly published some observations upon this metal: we shall just give a short account of those in the present work.

WHEN the fusion of metals is made with a strong fire in open vessels, or only lightly covered, it frequently happens that those loose particles, upon which the very essay is intended,
escape

escape and are no more to be collected : this consideration has determined M. Marggraff to continue for several hours the fusion of tin in such vessels as are perfectly well closed.

AMONG other operations, he put one ounce of English tin in a Hessian crucible, and upon it a round plate of polished copper, cut to such a size as not to touch the tin, upon which he luted another cover of clay as exactly as possible. After a moderate fire during an hour and half, he found under the copper plate a white pellicle, friable, and entirely resembling the flour of zinc. It does not appear to be arsenic, because, 1st, it stands a pretty strong fire ; 2dly, its texture being like wool, shews a calx of zinc ; 3dly, it does not whiten copper as arsenic does. If M. Marggraff ventures not yet to declare it to be true zinc, at least his conjectures agree with Mr. Henkel's observations, who in his *Pyritologia*, printed at Leipzig in the year 1725 (p. 574.) says, that, without any admixture, one may extract zinc out of tin, and that upon breaking the furnace in which that metal has been melted, the materials of zinc will be found. In another place of the same work (p. 272.) he assures us of his having made sufficient experiments upon this article.

THE 21st dissertation shews the knavery of a set of people, who ascribe marvellous virtues to a certain vitriolic salt of alum, which they sell by the name of a true fixed alkaline salt of the Rhinoceros.

THE 22d contains experiments made on that new mineral body known by the name of Platina del Pinto. The English authors who write upon that mineral inform us (*Transact.* vol. 48. p. 638.) that it is found in the gold-mines of the Spanish West-Indies : other accounts say that it abounds in form of sand in the rivers of the province Quito. Mr. Bertrand of Geneva, member of the academy at Berlin, assures us, in a letter written to Mr. Euler, that he had it from the mouth of a Spaniard who has been on the very spot, that Platina is dis-
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perfed over all the country, fituated near a river which runs through the mountains of Peru near Quito. It has hitherto been very difficult to obtain any certain lights into this matter, the Spaniards refufing any information about it, becaufe it is very profitable to mix with gold and filver. In the year 1753, the Englifh obtained a quantity of it, fome pounds weight of which were given to D. Lewis at Kingfton; which enabled that learned gentleman to make the firft experiments upon that mineral. At laft M. Marggraff had fome of it by Mr. Euler, and made the effay published in this memoir, to which we refer the reader, becaufe fo manifold and different are the proceffes he gives therein, it would require in fome meafure a complete tranfcript, to give a juft idea of them: we fhall therefore only mention, that Platina approaches the neareft of all bodies known to the weight of gold, being in proportion as $18\frac{1}{2}$ to 19. It may be proper at the fame time to inform the reader what is the opinion of Mr. Marggraff concerning the origin of Platina: he fufpects that mineral to be the product of an amalgamation made with mercury, for the feparation of gold out of other ores with which it was mixed *.

SOME experiments made upon the ftone called lapis lazuli are the fubject of the memoir that fucceeds to that on Platina.

* Mr. Marggraff fupposes that the Platina is rather the production of art or accident than of nature, and that it is merely the effect of a long, reiterated amalgamation of mercury with gold and its ore, which is done for the fake of feparating the pure from the impure parts; and that by the frequent repetition of this procefs, the quickfilver at length acquires the fixity of the matter in queftion, by imbibing or uniting itfelf with fome of the fulphur or other fixing quality which it finds in the nobler metal. For this reafon, he fays, Platina is always found granulated, never in an embodied metalline form, or in an ore; and for this reafon he fays its weight is fo near that of gold, and adds that gold and mercury may, by certain operations, both be extracted from it: but if this were the cafe, let us request how it comes to pafs that the Spanifh writers have none of them been able or willing to give us the truth of this ambiguous affair, which has excited fo much speculation among chymifts, fince, if Marggraff's opinion be right, and there is much plaufibility in it, there does not appear any particular reafon why the Spaniards fhould be folicitous to keep the knowledge of this production fuch a profound fecret from the reft of mankind.

Lapis

Lapis lazuli is a blue stone, inclining to a violet colour; of an indifferent hardness, with light veins, frequently spangled with metallic particles representing gold, which, however, being carefully examined, yield a sulphureous marcasite, of a cubical form. Those veins of a light splendid lustre are nothing else but a mere loose and shining talc. Some parts of this stone strike fire with steel. M. Pomet, in his History of Drugs, gives a very particular description of the outward appearance of this stone. Other authors mention it, and in some things they agree, in others they are of different sentiments about it: M. Kunckel is worth consulting upon this subject, in his appendix on precious stones, which is annexed to his *Ars Vitæ*. Imperati, in his Natural History, in Latin, lib. iv. c. 10. lib. xxii. c. 40. and lib. xxiii. c. 10. Matthiolus, Jerome, Cardan, in his treatise de Mistis, and Agricola of the Nature of Fossils, lib. vi. c. 17. to which may be added, Le Franc Jouaillier and Baccone, in the Museo di Fisica e di Esperienza, p. 280. It is easy to perceive that the notions of some of these authors, particularly Imperati, Matthiolus, Cardan, Agricola, and Le Jouaillier, concerning this stone, are not very accurate. In Henckelius Redivivus, p. 71. and in the posthumous mineralogical writings of the same authors, pag. 404 and 471, the lapis lazuli is reckoned amongst the copper ores; it is also referred to the same head in Gellert's Metallurgic Chymistry, p. 44. and in the Mineralogy of Vallerino, page 120 and 132. Many other authors are of the same opinion, without believing, however, that it contains much copper. The experiments of Mr. Marggraff contradict entirely that opinion, proving that there is not even the least appearance of copper in any of the sorts of that stone, which he had ever examined. This expert chymist thinks that this copper marcasite, as it has been supposed to be, is nothing else but a sulphureous pyrite mixed with iron. He finds in his process upon it, that the pure lapis lazuli contains loose particles of iron, and a gypseous or selenitic earth, formed by the mixture of a calcarious substance

stance with a vitrolic acid, or that which is commonly called glafs-spar.

AFTER having shewn, in his 24th dissertation, the best manner of separating the alkaline substance from common salt, and laid down accordingly the surest method to obtain a very fine and pure nitre of a cubical form, M. Marggraff gives, in the 25th treatise, some experiments, proving that the alkaline part separated from the culinary salt, is a real alkali, and not alkaline earth. In the subsequent dissertation, he gives an account of the effects which this alkaline salt has upon the regulus of antimony. The last treatise is a narration of some remarkable observations in chymistry: First, upon vitriol of iron. Secondly, upon a kind of rosin obtained by a mixture of rectified oil of amber, with the concentrated acid of nitre, which has the particular fragrance of musk. Thirdly, upon camphire. Fourthly, upon the solution of vitriolated tartar in aqua fortis, with which this work is concluded, which is no discredit to the name of its Author.

P A R I S.

Avis au Peuple sur la Santé, or, A Treatise upon the most Common Disorders. By M. Tissot, M. D. and member of the Societies of London and Berlin.

THIS is a new edition of a book published some years ago, to which the author has now added the description and cure of many disorders, and particularly of those which require the most immediate assistance. This book, he tells us in the title page, was composed for the benefit of country people, and those who live in villages, where the advice of a physician cannot be easily obtained.

PRINTED for P. F. Didot, jun. Quai des Augustines à S. Augustin. Our Readers may expect some useful extracts from this in our next.



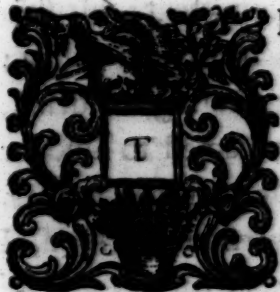
THE
MEDICAL MUSEUM.

Nº XVII.

A Differtation on the Hydrophobia, and a particular Instance of that Disorder occasioned by the Fruit of the Beech-tree.

By Christian Frederic Selcg, M. D. of Enbenstoff in Saxony.
Printed at Ellang in the year 1762.

[Read before the University there with great applause.]

“  HE practice of physic informs us, by various examples, that events may frequently happen in disorders, of such an unexpected and extraordinary nature, as reasoning cannot always foresee. We not only find that very often in the common course of diseases occurrences do sometimes arise which exceed our comprehension, and perplex the methods and prognostics of cure; but likewise we have often observed the very causes themselves of distempers to vary, and sometimes to be produced in a very marvellous manner. Instances abound in both ancient and modern authors, from which it appears that

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there is hardly any distemper which may not sometimes happen from an unusual and extraordinary occasion. It is well known that this disease is most commonly derived from the bite of some mad animal ; but who can believe that it could ever be caused by the fruit of the Beech-tree? yet my worthy father, who was a respectable physician, saw an instance of this some years ago in his own practice, which he carefully noted down in his diary, and reserved with a benevolent view of my communicating it in this dissertation ; and I now proceed to comply with his intention, by giving the case as delivered from his own pen.

The history of an Hydrophobia which happened the 20th day of October 1727, to a boy of thirteen years of age, from a plentiful eating of Beech-nuts.

I WAS on this day (the 20th) at an iron-work called Aurora, situated on the mountains of Saxony, to see a patient, named Sigel, the master of the works ; when I was told by the servant of the house, that her son, a boy of thirteen years, had been very ill for some days. Inquiring how I might see him, I followed her, and she brought me to the place where he was ; scarce was I come into the chamber, when I found the patient in great pain, languid, and terrified with apprehensions of present death. His pulse was very unequal, sometimes extremely quick, sometimes languid and intermittent ; his skin burning violently, his mouth flowing with froth and saliva ; he was tormented with intolerable thirst, intreating for drink, but as soon as any liquor was brought, he seemed to shudder with equal horror as if he had been eating unripe grapes. Upon asking whether he had the same aversion for food, I was informed that he had that day eaten very eagerly a large piece of boiled pudding. I questioned them if he had ever been bitten by any mad animal ; both the boy and all the people about him assured me that they had no knowledge of any such accident ; and all attributed the cause of the disorder intirely to a large quantity of Beech-nuts, which he had four days

days before been baking upon a furnace in which tin was melting for tinning iron-plates; soon after which he was seized with torpor, gloominess, and dread of liquids. Dubious, therefore, what to do in such a remote country place, destitute of all proper medicines, I was, though unwillingly, obliged to leave the patient to his fate.

THE day after, early in the morning, I found him in the same condition, except that he now seemed to talk more in his wildness and perturbation of mind, and his mouth flowed with foam more abundantly than the foregoing day: the urine he had voided by night was red and fiery, depositing a copious, turbid, white sediment, resembling an emulsion made of Beechnuts, subsiding as deep as the breadth of one's finger at the bottom of the vessel. A few hours before he died he vomited a porraceous bile; after which, beyond expectation, he went off quietly and without convulsions.

IN order to give a full explanation of this case, we purpose to proceed, in the first place, with shewing by various instances and authorities that the like cases have happened from unusual causes, without being consequential to the bite of a mad animal, by which our case will be illustrated, and from which the various causes of the disorder may be known. Secondly, We shall speak of the particular species of Hydrophobia arising from the bite of mad animals; from which we shall draw the fundamentals for explaining the case before us. Finally, We shall from these premises proceed to explain how this case was efficiently produced. May heaven propitiate our endeavours, and render them useful to mankind!

SECT. I.

IN this first part of our treatise (he says) we shall give a view of no small number of similar cases, which, like this we have been relating, are not occasioned by the bite of any animal. Not only modern, but also ancient authors furnish us with remarkable examples of this sort.

CÆLIUS AURELIANUS, who describes the Hydrophobia in a most elegant and masterly manner, observes that an Hydrophobia sometimes happens without any manifest pre-disposing cause: and Soranus relates, that himself had seen an infant bear the same sort of terror to its mother's milk. In later ages, in which the science of physic shines with greater effulgence, we find frequent histories of such instances: amongst the first are those of Petr. Salius Diverfus, Marcellus Donatus, Fel. Platerus, and other writers of the higher age, who have related cases expressly illustrating this subject; and of these later times many celebrated physicians, as well in the *Nat. Curios. Ephemeridibus*, as in the *Transactions of Breslaw* and the *Commercio Liter. of Norembergh*, as also in the writings of the immortal Boerhaave, and Sanches, Razow, Labirotte, who have confirmed the truth of former histories by their own later observations.

It may not therefore be deemed improper for us to give a distinct account of some of the cases delivered by these eminent men, since they may severally tend to illustrate this we have given.

THE first, and one of a very singular nature, is, that recorded by P. Salius Diverfus, in his treatise *De Febre pestilent. c. xix. p. 362.* A woman of thirty-six years was seized with a pestilential fever; from which recovering, a dysentery followed, which being relieved, she immediately fell into a total horror at every sort of liquor, and died in eight days, though it was asserted she had not been touched by any sort of dog, either mad or not.

MARCELLUS DONATUS, lib. vi. c. i. p. 296 & 291. *Hist. mirabil. Med.* gives the following instances; viz.

I. A man of fifty years, who was at dinner, perceiving something to stick in his throat, took up the cup, that he might by a draught of drink remove the inconvenience, but
he

he could not swallow a drop, and fell back at the sight of the liquor: this effect continued for three days, when he was brought to me; and in his way eat a good many grapes. Having inquired into the symptoms, and ordering some drink to be brought (for he complained of being choaked) at the sight of it he was in an horror, trembled, and fainted away; the liquor being removed he came to himself again, recovered his senses, stood up, became cool, had no more horror, and all his functions were restored, except that he could not bear the sight of liquids. He died three days after. Though I made the strictest inquiry possible, no cause appeared to which this disorder could be attributed.

OUR author then proceeds to give four other cases of different people who were seized with the Hydrophobia, though it did not appear that they had ever been bitten by any mad animals.

A MARRIED woman, who died the fifth day.

A GIRL of sixteen years, who was frightened at the sight of sword-players, was seized that night with a fever, and had sudden eruptions about her lips; in twelve hours, they say, she was raging, and in twelve more the fever abated. Her left arm became paralytic, and if it was moved, all that side was transfixed with exquisite pain, which, as she said, went even to her heart, so as almost to kill her. At four o'clock such a rigor came upon her, as obliged her to lie down: her pain increased, nausea supervened, anxiety, and foaming at the mouth: she could not bear the light, she yelled, she raged, she was in terror: drink being offered she drew back her head; she was in horrors; she faltered and spoke plain, at intervals; after this, by gnashing her teeth she bit her tongue to pieces; and in this miserable condition she died in the morning of the fifth day.

THE fourth case from Donatus, is of a countryman thirty-seven years of age, who had a pain in his arms for eight days without knowing the cause, or refraining from his daily labour on account of it: he felt no fever; yet on the ninth night, when at supper, he fell into the greatest horror at the sight of his broth, and had many other symptoms of the Hydrophobia. A physician ordered the hiera picra, which he threw up with bloody vomitings; myself being also called in, found it to be the Hydrophobia, from offering him a cup that stood on the table. He died four hours after with terrible groans, yellings, inquietude, profuse sweats, coldness of the extremities, violent rage, contortions, and agonies of horror.

THE fifth case adduced from this author was of a young healthy peasant, who without any manifest cause, as returning from the fields in the evening, fell into a sudden sweat, when, as he said, he felt an anxiety and tightness at his heart; several other symptoms soon coming on, he was seized with the Hydrophobia, and died.

OUR author then quotes another instance from Fel. Plateus in Obs. suar. lib. i. who gives us the following example of a spontaneous Hydrophobia. A shoemaker's wife, who had been to wash an hide at the river, was terrified at her being left by her companions as night approached, and from that time she could no more swallow liquids; and when any thing of that kind was brought before her, she seemed to be in danger of suffocation, being attacked with a violent singultus. She could neither bear the sight of fluids, nor even the motion of the air: she expired on the eighth day.

IN the Acta Natur. Curiosorum there are many very extraordinary relations of spontaneous Hydrophobias.

OUR author produces five; the first, of a man of forty; the second, of a young man of fifteen; the third, of a man
of

of forty-seven; the fourth, of a woman of forty; and the fifth, of a woman, who all died of the Hydrophobia without manifest signs of infection from the bite of mad animals, &c. He then proceeds to give an instance to the same purpose from the Annals of Breslaw, ann. 1719, for the month of February, c. iv. art. 17. To these he adds two other instances from the Norimbergh Commer. Liter. related by Dr. Koeler, one of a soldier, the other of a gentleman. He instances also a case from the Edinburgh Essays of an Hydrophobia caused by an inflammation of the stomach.

BUT (he says) more particularly the instances given by the great Boerhaave and Sanchesius deserve to be noted.

THE former often mentioned to his pupils a case which he saw; viz. a man fall into an Hydrophobia from a fever, who died on the third day. This poor man had been used, tho' the weather was intensely hot, to exercise with great violence, after which he would expose his head for four hours together in the burning rays of the most scorching sun, as he sat upon a bench drinking strong spirituous liquors.

SANCHESIUS relates a similar case of one Peter du S. Ray, of twenty-five years of age, who being of a bilious complexion, in the month of May, after an extremely hot season, in which he had walked a good deal, was seized with a continued fever, attended with the Hydrophobia, though he had not been bitten by any mad dog. Although he was raging, yet at times he spoke rationally; but he could not bear the least sprinkling of water, nor to drink it; wine or broth excited the same horror. He often shook his head; and being persuaded to drink, called for water: he knew he could not live; nor could he drink, but when a pipe was conveyed to his mouth, and then he was in such terrors that he trembled all over, shuddered, and sweat. He died on the fifth day.

HE

HE then cites from the *Diar. Eruditor.* lib. c. the cases of a man of thirty, and also of a monk of thirty-three years of age, who both died of the *Hydrophobia* without ever having been infected by any mad animal, as far as could possibly be learned. He then mentions several accounts to the same purpose recorded in the *Recueil Periodique d'Observations de Medicine*, &c. One by Laurens, another by Tre-court, as also Brooiani, in his treatise on the Natural and adventitious *Venom of Animals*, Florent. 1757, p. 101. Also relates two cases which correspond with those already mentioned.

OUR author therefore concludes his first section with observing, that from the cases he has given, it appears that there are many instances of spontaneous *Hydrophobias*, and those arising from various antecedent causes; and that hence, tho' strange it may seem, yet it will appear, he says, that the case we have described might be caused as above related. But that we may explain the immediate manner how this disorder is produced, we shall now proceed to the second section, in which we shall endeavour, as far as we are able, to investigate the internal causes which excite the disorder, and which are universal in the *Hydrophobia*, when derived from the bite of a mad animal.

SECT. II.

THAT disorder is universally called the *Hydrophobia*, in which, with other symptoms, as a fever, rage, convulsive spasms, there is this particular, that the patient thirsts excessively, and desires drink, but as soon as it is brought, or he only sees it, he shudders with horror, or is convulsed. It is also called *rabies canina*, or dog-madness, because it is generally occasioned by the bite of a mad dog; or else because those afflicted with this calamity yell, bark, and sometimes even bite like a dog.

OUR

OUR author then shews, that in many disorders there may be some of the symptoms usual in this, but the dread of water is its peculiar and distinguishing characteristic: this symptom most commonly arises from the bite of a mad dog. When dogs are mad, they run violently about, and bite at every thing. It is a doubt if any creatures, besides dogs, wolves, and foxes, are subject to this distemper, except by infection*; but it is evident that all the canine species fall into this disorder from being exposed to very inclement weather †, from putrid water, &c.

WHEN dogs are going mad, it may be known by the following symptoms: they are at first very dull, solitary, and have unusual gestures, sometimes running against walls, and snatching as if they seized upon their game; they are generally silent, but somewhat murmuring; their ears and tails hang down; their eyes look stupid, maniac, and prominent; when they are asleep they seem to be full of fear, trembling and barking; they refuse meat and drink; they are wrathful and snappish with all strangers, but do not as yet forget their masters. These are the signs of incipient madness. They then begin to breathe with difficulty, shoot out their tongues, foam at the mouth, become gaunt, grow mad and rage, running along the highways in perpetual disquietude, now swiftly, now slowly, stumbling as if half asleep; they bite at every thing they meet with, not excepting even their masters, whom they no longer acknowledge. In this stage of the disease they never bark, nor even yelp if they receive a blow; besides their eyes roll full of tears, besmeared with dust, and inflamed to a great degree: other dogs fly from them ‡. This is the

* Van Swieten Comment. ad Aphor. Boerh. t. iii. ad § 1132.

† Aetius, lib. vi. cap. 24. p. 107. Aët. Natur. Curios. vol. v. observ. 5. Jac. Grevine, lib. De venenis, Antwerp. 1571, 4to, lib. i. p. 134 & seq.

‡ James's New Method of curing the Hydrophobia, p. 36. Acad. des Sciences 1723. Hist. p. 39. Conf. Jod. Lommii Obs. Med. Ed. Jen. p. 73, & Jac. Grevine, loc. cit. p. 137 & 138.

second stage of their madness; after which, unless they are killed, they die convulsed in thirty hours. If a piece of meat be dipped in the foam of their mouths after they are dead, and then offered to a sound dog, he will not touch it, but fly from it with cryings and yellings; and this is a method of knowing if a dog that has been killed was really mad, for the satisfaction of those who may have been bitten by him |||.

THIS disorder is not only communicated by the bite of the mad dog, but also by any of the humours or juices that proceed from his body; and more especially from the saliva, if it happens to be inserted in a sound body, so as to become mixed with its juices *.

THERE are also many instances of people being seized with the Hydrophobia from the bite of an angry dog which was not infected with that distemper †. An otter being greatly enraged, and biting a person who caught him, this disease followed. The same effect has been produced by cocks, when fighting, wounding with their beaks persons who have interposed to part them ‡, of which there are many examples; || but what is more extraordinary is, that even a man who only bit his own finger through excess of rage, is said to have incurred this disorder therefrom; which, though generally caused by the bite of a mad animal, yet there are many and various instances, besides those already mentioned, wherein it has happened without such a cause, as is elegantly shewn by the great Boerhaave from many examples; he says, “Ei-
“ ther from a bite, or only from the slightest touch through

||| Medical Museum, vol. i. p. 442.

* Vide Platner Inst. Chir. § 500.

† Act. Physic. Med. vol. vi. obs. 91. Ibid. vol. iii. obs. 2.

‡ Cæl. Aurel. Acut. lib. iii. c. 9. n. 100. Baccius De venen. p. 16.

|| Epist. J. B. Scaramucci ad A. Magliabechium in Misc. Cur. decann. 3. 2.
9, 20. App. p. 250.

“ the cloaths, when only a scar is made, and not any blood
 “ drawn by the tooth ; by the touch of the recent foam, or
 “ even, though it be dry, received from the lips or the tongue
 “ only, by a lick from the mad dog ; nay, even from han-
 “ dling much the instrument with which the mad creature
 “ was killed, in the part that gave the wound ; by eating the
 “ milk or flesh of a mad animal ; or, in short, by much and
 “ frequently fingering any of the above-mentioned infectious
 “ matters, the disorder may be acquired.” There are so
 many proofs of the truth of these remarks in different books,
 that they can scarcely be doubted. The breath of a mad dog
 drawn in at the mouth, as Cælius Aurelianus has observed,
 may cause the disorder ; but a more recent observation * con-
 vinces us of the possibility of that manner of infection ; from
 all which it is manifest how extremely contagious is the Hy-
 drophobic venom, which is further confirmed by the instances
 given of people having received the infection from a slight
 scratch by the claw of a cat †.

S E C T. VIII.

AND yet it does not always happen that the contagion
 comes from such slight occasions ; for it has been observed,
 that men have trod with their bare feet upon the foam of a
 mad dog, and received no mischief from it ‡ ; nay, sometimes
 even the bite of a mad dog has not conveyed the disease.
 The celebrated Anton. Cocchi || has observed many men, who
 were each of them bitten by the same mad dog, some of
 whom died of the Hydrophobia, though all possible means
 were used to prevent it ; and others, who took no medicines,
 escaped the disorder. This disorder, therefore (§ VII.) like

* Promptuar. Hamburg. tom. xx.

† Fabr. Hildanus, Obs. Chir. cent. I. obs. 86. p. 61.

‡ Choisel Nouvelle Methode pour le Traitement des Personnes attaquées de la Rage, Par. 1756, 8vo.

|| Bagni di Pisa, Firenz. 1750, 4to. Mai, p. 318.

the plague, differs in its degrees of contagion upon different constitutions.

S E C T. IX.

As the infection is more or less potent, so the disorder begins in fourteen or fifteen days in different people and circumstances *. When the infection is communicated to the face, the disorder is generally the most speedy †; and again it is more quick and violent in proportion to the progress with which it rages in the mad animal, or according to the time it has been disordered. The infection has sometimes been so weak and slow in its progress, that it has lurked for several years before it became strong enough to break out ‡; which is, as our author observes, always according to the virulence and activity of the venom and the state of the bodies on which it is inserted.

S E C T. X.

HE then proceeds to give a very full and minute account of the progress of the disorder from its incipient to its final stage.

HAVING spoke briefly of its antecedents, we now proceed to describe the distemper itself, and to shew its advances: but we must first observe, that here, as well as in the foregoing, some diversity takes place. For in some it is observed to hasten with the most rapid progress towards its conclusion; in others, to be fourteen days before it comes to its height, like acute fevers ||. We shall therefore give a succinct description of this distemper and its progress, as far as relates

* Cæl. Aurelianus, lib. c. Sauvages Diff. sur la Rage, p. 5.

† Ibid. p. 4.

‡ Ibid. p. 5. Schenkii Observ. Med. lib. vij. p. 249. Platner, loc. cit. Laur. Joubert Op. tom. ii.

|| Van Swieten Comment. tom. iii. § 1137.

to our purpose, with an account of those varieties which sometimes happen, according to the observations of the best authors,

SECT. XI.

WHEN this disorder is caught, the patient, 1. perceives a slight pain in that part where the wound was infixed, chiefly in the cicatrix, often attended with itching, and, except in that, approaching to a rheumatic pain, extending into the neighbouring parts, wandering, and passing from the extremities into the internal region; then the cicatrix begins to tumefy*; the wound frequently grows angry again, and even discharges blood†; which, however, generally happens when the disorder is advanced, and the fever runs high. This pain is accounted by Pet. Salius for the primary and invariable mark of an incipient Hydrophobia‡. But besides this particular pain or foreness in the cicatrix, 2. other more general ones, resembling rheumatic pains, of a quick, flying, convulsive kind, affect the patient in the neck, joints, and other parts: frequently a dull pain seizes the head, neck, breast, belly, and even runs along the back-bone§. Also towards the conclusion of this disorder the patients complain of this sort of pain shooting from the arms towards the breast and region of the heart**. Besides this, 3. a lassitude, heaviness, and an effete sort of languor follows, the head is vertiginous, and affected with a dull heavy pain. 4. The sick become very gloomy, murmuring much, like melancholy people, sometimes forgetful, drowsy, and at times a little disordered in mind, by turns wrathful and passionate|||. Their slumbers

* Sauvages Differt. cit. p. 52.

† Act. Nat. Cur. vol. vi. obs. 91. p. 317.

‡ De Affect. particul. c. xix. p. 364.

§ Choisel on Madness, p. 50.

** Ephem. Nat. Cur. dec. iii. a. 2, obs. 104.

||| Lemmii Observ. Med. lib. 6,

are disturbed with horrors, and awaking they fall into convulsions and violent agitations. 5. They sometimes complain of hardness of hearing, sometimes of a tingling in the ears; the eyes become uncustomarily filled with tears, and of a sorrowful aspect; they sometimes indeed are yellow, particularly about the canthæ of the eyes, the ends of the fingers, and palms of the hands *. Their faces become pale and contracted, and they sweat much about the temples. 6. They have an unusual flow of saliva, the fauces dry, the tongue foul, except at the sides; in some the mouth unusually fetid †. But with all these, 7. the sick are, immediately from the commencement of the distemper, afflicted with a particular stricture and heaviness on the breast; they struggle for breath, they sigh, nauseate, and vomit. This oppression of the præcordia is one of the primary and constant symptoms of this disorder; for it begins with the disorder before the dread of water takes place, increases with it, and attends it to its last stage, till at length the patient expires under it.

THESE nearly complete the first stage of this disorder: it is thought to be melancholy, because the sick are dejected and sorrowful under it. With some it is of longer, with some shorter duration. 8. The pulse in this stage is for the most part like that of a sound man; yet by times in some slower, in some quicker, but generally feeble and intermittent. 9. The urine is pale, with a small tincture of yellow, frequently frothy, and after some days grows foul, and deposits a sediment; nor is it voided without difficulty ‡. In some an obstinate costiveness continues through the disorder ||. 10. The blood, when taken away, has in all respects appeared like that of a sound man.

* Schraderi Fasc. I. Obs. Rer. p. 52.

† Ibid. p. 53.

‡ See the above author.

|| Cælius Aurelianus, Acut. lib. iii. c. 14. n. 117. Th. Bonet. Sepulc. Anat. p. 215.

S E C T. XII.

As the disease advances beyond this point, its second stage commences: the former (§ XI. p. 109.) symptoms then increase, the anxiety and stricture of the præcordia grow also more violent, the breathing more difficult, the afflux of spittle in the mouth more copious, and the convulsive motion of the tendons and arteries becomes more conspicuous: then, indeed, 11. the fever comes on, which is different in different subjects; mostly, however, mild, not unlike (or equal) to a malignant fever, attended with momentary horrors. In some cases it is said there absolutely was no fever; nor does Peter Salius account it essential to the disease, since of many he only observed a fever in two cases; nevertheless in some the fever has been observed to be pretty strong. 12. The wakefulness is continual, and the mind becomes more disturbed, and even sometimes delirious. 13. Among these, that most remarkable symptom of aversion of water and all kinds of liquids accedes. At first they feel a difficulty and somewhat of a constriction of the gullet in swallowing; but as yet they freely take liquids; afterwards however they refuse drink, and are no longer capable of bearing it: this augments so visibly, that when any liquid comes before their sight, immediately they are seized with horrors, and when they are compelled to drink by the people present, or strive to do it from their own motive, they are seized with various spasmodic contortions of the muscles of the face, a prodigious anxiety, with the loss of their senses; as soon as they have tasted, or even touched the surface of the liquid, they then feel a strangulation in the throat, their stomach becomes inflated, the larynx outwardly swells suddenly, and as suddenly falls, and the muscles of the neck have been seen to swell so extremely during the fit, as to equal the bulk of the head; those affected thus, although they cannot swallow liquids, yet still remain capable of swallowing solids without any dread of them, but patiently take them at the request of the standers-by; however they do it with

with a remarkable avidity or rapaciousness, with trembling hands, infirmity of mind, and also a difficulty in swallowing; if this symptom grows more violent, then they are deprived of the faculty of swallowing even solids, which they either entirely refuse, or else, if received by the mouth, are obliged to eject them. It is further observed, that even clysters are insufferable to these patients, and that they either will not admit them, or if they do, they then undergo most terrible exacerbations. If the fauces be examined for the cause of this disorder, in general, nothing preternatural is discovered; no inflammation, nor any unusual appearance is observable in the external muscles of the neck. 14. Another symptom, which is equally wonderful as the precedent, is a most exquisite sensibility, or, as it is commonly much better termed, irritability of the body; the patients can hardly bear the least motion or breath of air; if a window or door be opened, or if any one present approaches them, and speaks full in their faces, they are greatly affected, and cover their mouths as if in dread of suffocation: they are terrified at and shun the light, with whatever is luminous, and therefore intreat to be concealed in some hiding-place. Even the least sound is intolerable; from whence it may be imagined that the auditory organs are affected *. 15. Thus afflicted, they mourn lamentably, and wail in imperfect murmurings, frequently seeming to bark like a dog; yet this is not continual, but only under the violence of the distemper: by intervals, chiefly at that time, their minds are so depraved, that they no longer know their most intimate acquaintance; they then become rabid, and shew the desire of biting †. However, this rage and desire of biting do not always happen, neither do the patients invariably howl like a dog ‡; for though they rage during the fits, yet these fits ceasing, 16. their senses return

* Hucauld sur la Rage & ses Remedcs, Par. 1714, 12mo.

† Lommius, lib. c. p. nobis 72.

‡ Misc. Cur. Nat. dec. iii. 2, 2, obs. 104.

during the remaining course of the distemper; they know those who are with them, call them by their names, lament their own calamity, knowing the danger of it, and through a peculiar dejection of mind foretel that they cannot survive it. Besides, they are very desirous of drink to mitigate their burning thirst, and even by contrivances, or stretching themselves forward, endeavour eagerly to seize it, but finding their attempt in vain, they droop into the most affecting despondency. It is another sign of their rectitude of mind, that they advise their friends to keep at a distance, lest they should bite them, which they are unwilling to do; so likewise they intreat that when the fit comes on, they may be held down from doing mischief. 17. Another peculiarity also observable in this stage of the distemper is, that the patient is attacked with the priapism and involuntary seminal emissions: this was formerly observed by Cælius Aurelianus *, and afterwards by many others †; nay it is further said that some have, from this incentive, even actually indulged the passion ‡.

SECT. XIII.

WHAT we have said in the preceding section makes the second stage of the disorder; but it is not yet arrived at its highest point: when this stage draws towards a conclusion, then to the above symptoms others more violent and terrible are added. 18. The fever rages more ardently, the thirst increases, the tongue becomes furry, and the voice hoarse, the urine little and lixivious; besides the tongue hangs out, the mouth foams, the pulse throbbing and convulsive. Under the 19th stage frequently the highest degree of rage and violence of force is observed, in which the sick must be bound down

* Acut. lib. iii. c. 11. p. 103.

† Jod. Lommius Observ. Med. p. nobis 72. Bonet. Sepulcr. p. 215, 216. Phil. Transf. vol. v. p. 369.

‡ Bonet. Sepulcr. Anat. lib. c.

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in their beds, lest they hurt themselves by their own furious exertions. At length, 20. the strength fails, the extremities grow cold, cold sweats begin, tightness of breast almost approaching to suffocation comes on; by which in a short time they generally expire in spasms. 21. After death the bodies scarce ever grow stiff; they long retain warmth, and soon putrefy; sometimes over their surface livid spots are scattered and pustules full of yellow ichor, as if the part was burnt.

SECT. XIV.

MANY dissections of the bodies of those who died of this disorder have been made; but they seldom agree in their appearances; for in some the fauces, œsophagus, and ventricle are found inflamed *; in others not at all †: but more frequently the ventricle and intestines have been found wounded with punctures and inflamed spots. In a dissection mentioned by Bonetus ‡ the liver was found on its convex almost sound and well, but on its concave side, together with the interior coat of the ventricle, so extremely inflamed and almost mortified, as not to bear the impression of a finger.

THE following account of the liver being affected in like manner is given by a later writer ||. “ From dissection and
“ inspecting the bodies of mad dogs that were opened when
“ cold (it being in the middle of winter, through fear of
“ steams reported to be so dangerous) and from the dissec-
“ tion of three men who had died mad, it appeared that the
“ viscera of the lower belly, particularly the liver, were af-
“ fected in the same manner, just as in malignant fevers; and

* Acad. des Sciences, 1699, Hist. p. 55. Phil. Transf. Abridg. tom. v. p. 369. Act. Acad. Elect. Mogunt. tom. i. p. 341.

† Bonet. Sepulcr. tom. i. p. 211. Phil. Transf. Abridg. tom. v. p. 368.

‡ Sepulcr. Anat. tom. i. p. 212.

|| Schrad. Observ. rar. p. 29 & seq.

“ that chiefly the liver proved to be marked through its
 “ whole substance with putrid spots of various colours. The
 “ bile was of a livid green, fetid, and heavy; the gall-
 “ bladder turned blue, almost black, as if it was gangrenous
 “ and putrefied. In the stomach, intestines, and mesentery
 “ were found mortified spots, and the meseraic vessels ex-
 “ tremely full of blood. The pharynx, larynx, and even the
 “ œsophagus, were in the same condition as they generally
 “ are in acute malignant fevers.” Besides this, all the muscles,
 viscera, brain, cerebellum, and spinal marrow, were more dry
 than usual, the pericardium arid, the lungs prodigiously stuffed
 with clotted blood, the heart almost filled with dry blood,
 the arteries full, and the veins empty; the blood itself ex-
 tremely attenuated, so as hardly to congeal in the air for three
 days *.

An Investigation of the Disease.

SECT. XV.

WHILST we direct our inquiries into the internal causes of
 the distemper, it may not be improper previously to observe,
 as its primary symptoms pretty plainly persuade the same, that
 the par vagum and intercostal nerves are the chief seat of the
 disease; for most of the symptoms happen in the begin-
 ning of the distemper, as well as in its progress, in those parts in
 which the branches of the intercostal nerves and par vagum
 are dispersed, or have communication. Immediately in the
 beginning of the distemper, the patient is taken with spasms
 and pains in the joints, in the neck, and several other places;
 and through the whole course, from beginning to end, they
 find a particular oppression of the præcordia, a stricture of
 the breast, anxiety, difficulty of breathing, with sighs, and a
 constriction in the fauces; besides, in the very fits, when the
 dread of water is begun, there is a particular sensation ascend-

* Acad. des Sciences, 1699, Hist. p. 55.

ing from the præcordia to the parts above, which terminates, as it were, in their eyes, as the place where the intercostal nerve takes its origin. All which symptoms are particularly concerned with the intercostal nerve and par vagum.

S E C T. XVI.

Our scope does not require, nor will the limits prescribed to our discourse permit us to say so much concerning the trunk of these nerves, as may seem to be requisite; which we the more readily pretermit, as our illustrious president has already treated upon the intercostal nerve and its connexion with others; where, after shewing the various opinions of many authors, he has discovered and demonstrated at the anatomical theatre, not only its true source, but also the distribution of the trunk (partly in *Epist. Anatom. de controversia Nervi intercostales Origine*, Erlang, 1747; partly in *Dissert. de Nervo intercostali*, Ibid. 1754, both with cuts): it may suffice to remember, that the intercostal nerve arising from the fifth and sixth pair of the brain, having passed from the skull, and going down the neck, forms not only several ganglia, and chiefly the great cervical ganglion, the superior and inferior ones, from which the branches of the pharynx, œsophagus, and larynx are derived; but likewise by the meanders it makes, it communicates with those nerves which are in its way; it also sends off the cardiac branches and others verging towards the subclavian veins, thro' the greater thoracic ganglion. He then proceeds to shew how different branches of these nerves are detached to several other parts that are particularly affected in the *Hydrophobia*.

S E C T. XVII.

THE par vagum, or eighth pair of nerves, descending thro' the jugular perforation, and, together with the spinal nerve, leaving the skull, in its progress not only supplies the tongue, the neighbouring muscles, and larynx with branches, but like-
wife

wife communicates with the intercostal nerve and other branches in those parts: after it enters the breast, it not only detaches branches to the right towards the subclavian artery, and on the left side towards the bending of the aorta to the larynx, but likewise to the pulmonary plexus. Besides these many small branches are sent off to the pericardium, mediastinum, œsophagus, to the heart, and to the great artery; afterwards, both trunks of the par vagum lying on the œsophagus, descend, and the right posterior and the left anterior are intertwisted together by various complications of net-work branches, until, together with the œsophagus, they pass into the diaphragm, and are not only diffused through the whole surface of the ventricle, but likewise are partly intermingled, especially to the right side, with the semilunar ganglion and celiac plexus there situated; and at the same time as they constitute the plexus thence arising of the abdominal viscera, they supply the principal branches of the hepatic plexus.

[To be continued in our next.]

N° XVIII.

On the Power of the External Absorption of the Human Body. By Dr. Wilkinson. Part I.

IT has been observed by physiologists that the animal body receives its nourishment from the food, after it has been first comminuted by digestion, through the means of certain vessels called lacteals, opening their mouths in the primary passages, by an absorbent power with which they are endued, attracting the chyle and conveying it to the blood, where, after proper elaboration, it constitutes a part of that fluid, answering the purposes of life.

ANOTHER order of vessels, more minute, more numerous, and perhaps not less admirable in their formation and utility, are observed to cover the surface of the animal body; generally believed, since the experiments of Sanctorius and Keil, to be there disposed to perform the purpose of perspiration; for through these vessels redundant humidity is said to be perpetually transpiring, though for the most part in an invisible vapour, yet extremely needful to be continued for salutary ends.

WHETHER these vessels be endued with a power to invert their own operations, and to become occasionally absorbent or excretory, or whether there be not another disposition of vascular orifices, equally minute and manifold, opening over the whole surface of the body, may not be easy to determine, though the latter doth not appear the least probable; and yet arguments might be advanced to support the former opinion: but that there is a great power of absorbency, however, effectuated in all the external parts of the body, cannot, it is presumed, any more than the perspiratory power, be controverted; which, perhaps, the following considerations, not generally unknown to the medical part of mankind, may tend to demonstrate.

A PIECE of gold held in the mouth, whilst the most distant part of the body is in immediate contact with mercury, becomes white in colour. If this effect be supposed to proceed from some attractive power which gold has upon quicksilver, and therefore not to argue the absorbency of the body, it will at least prove its amazing permeability, as it is so speedily penetrated by that mineral subtile fluid.

IT is universally known that quicksilver killed with lard, and rubbed upon the legs and arms, will salivate, purge, or provoke urine.

THERE is a certain preparation of arsenic, which being rubbed on some parts of the body, causes profuse sweating.

GARLICK

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GARLICK made into a pultice, and applied to the feet, communicates its flavour to the breath almost as powerfully as if the person had eaten plentifully of that fetid vegetable.

SITTING down upon an oak-tree that is newly fallen and just fresh barked, most commonly causes a purging. Sitting under a walnut-tree with low, spreading branches, causes an itching all over the surface of the body; and sitting under the manchanil-tree has a deadly effect.

SOLANUM lethale put upon the temples of a person grievously afflicted with pain in the fore-part of the head, has very speedily given relief.

SAFFRON applied externally on the region of the stomach enlivens the spirits, and, like a cordial, exhilarates the drooping heart.

THE celebrated Van Swieten suffered in his youth a temporary loss of memory by sleeping in the vicinity of a certain plant.

ABR. KAAU says, that by washing a boy's head with tincture of tobacco to destroy lice, he grew giddy, tumbled down, and vomited.

CAMPHOR put upon the carpus, or wrist, has been affirmed to cure intermittent fevers. Grounsel and tobacco on the stomach excite vomiting.

A FURTHER proof of the efficacy of external applications may be drawn from Dr. Pye's experiments, who assures us he has cured several intermittents by a quantity of the bark sewed up in a proper waistcoat, which was worn next to the skin by children who could not bear the internal use of it.

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A PLASTER made of bullock's gall is an empirical anthelmintic, which has frequently good effect, and is now commonly used in Italy.

SOME kinds of purgative medicines rubbed upon the abdomen will, in tender and young constitutions, cause purging. Professor Monro mentions in his lectures, that once by applying an aloetic cataplasm to a carious stump of an amputated arm, it caused purgings repeatedly.

HANDLING of scammony or aloes will cause very cathartic effects upon those who never meddled with those drugs before; and powdering black ellebore, jalap, or senna, will often do the same by those employed in that business. The manufacturing of elaterium does the same in a more violent manner; and colocinth will, only handled, cause an hypercatharsis.

CANTHARIDES, when laid to the head in plasters, very often affect the urinary passages; and an application of civet to the navel has sometimes cured the strangury caused by that means.

By handling turpentine for some time the urine will become affected, and smell very strong of it. And Schenckius relates a case of a man who made bloody urine from only carrying some Spanish flies in his pocket.

PULTICES or cataplasms fixed upon any part of the body speedily become dry: the moisture cannot be evaporated, because the animal heat is unequal to that effect, it therefore must be absorbed by the sponginess of the cuticular membrane.

PEDILUVIUMS, semicupiums, and ointments, are found to be of great utility in medicine, and might be more so if they were more frequently used. Pediluviums made of the infu-

sion of ellebore-root were in great estimation among the ancients to open the body and keep the belly soluble; and amongst the Germans, an ointment, called arthanitens, is successfully employed for the same purpose.

A TOAST of bread, enriched with spices, and soaked in some generous wine, put upon the region of the stomach, will strengthen and refresh so much as to prevent violent vomiting.

A PIECE of meat applied to the stomach externally, emits some nutritious particles into the cuticular absorbents, and a small degree of nourishment is derived from the application.

THE analogy between the immediate modes of nutrition in the animal and vegetable kingdoms has not escaped the notice of the ancient medical philosophers, and is by the moderns undisputed. The gardener finds by experience, that a tree which pined through the driness of the soil or season, soon recovers its salutary verdure, if he suspends from its highest branches a spongy rope communicated to a vessel of water, which the plant exhausts through the artificial medium.

ANIMALS that are drowned, and lie some time in the water, become greatly distended from absorbing the water.

IT may seem a strange conjecture (and yet it has its support in reason) to suppose the body to be endued with some ingeny or secret power to attract such qualities from contiguous bodies which contain them, as it is at that time most immediately in need of; yet this singular quality of Absorption or Attraction is visible in aged bodies, as is observed by some old authors: particularly Bacon tells us that an old person will draw some vital particles or nutritious recrement and balsam of rejuvenescency from a young fresh person with whom the former sleeps and lies constantly, so as to assume from thence a more florid and juvenile aspect. I could recite the

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the names and cases of some old people who have by this practice affected, in a very apparent manner, the young persons they have lain with. A young person who lay with a superannuated relation became feeble, attenuated, and died as through old age: and, as if the rejuvenescent supply was taken away, the old person soon after lost that fresh colour and strength she had before maintained very surprizingly, and decayed, pined, and died very speedily after her bedfellow. Parents should observe this for the safety of their children. These things duly considered, I may venture to say it will not appear improbable, that the body of any man, if it be in a state of extreme thirst, when brought into contact with water, will immediately imbibe such a quantity of it as may supply that exigence *.

Now

* As a man takes in air by the mouth and nose, so all the external parts of the body inhale and exhale. This is agreeable to the opinion of Hippocrates: for as the exhalations are produced from the extremities of the arteries, so are the inhalations performed by the beginnings of the bibulous veins. And that there is an Absorbency performed through the cuticle is manifest from experience. A man who is thirsty going into a bath of warm water will have his thirst quenched without drinking one drop of the water: from hence Hippocrates recommends warm bathing where the body wants moistening and to be cooled. In hot weather he advises warm baths, and in cold weather cold ones.

At Mocha, and other parts of Arabia, when the weather is so intensely hot as to cause excessive thirst by day, the people lie down at nights to sleep on the terraces or tops of their houses, covered only by one sheet, which is soon wet so plentifully with the copious dews, that the body, notwithstanding that the heats be great during the time of sleep, is refreshed, cooled, preserved from thirst, and moistened by its own absorbent power of attracting or inhaling the dews, even though the perspiration be also profuse whilst they sleep. The following instance of Absorption is too strong to be omitted.

Sed & alia est præterea causa, quamobrem, purgationis tempore, secretiones ad intestina vergant, nimirum insuetus ad temporis intestinorum æstus (quo de videas licet epistolam Bruneri ad Wepferum de Jalapio) quæque huic conjuncta est vis magna humiditatis attrahendæ; quam quidem caloris vim experimentis docet Keilius in disquisitione altera staticæ suæ Britannicæ annexa, cujus rei mihi quoque aliquando incidit exemplum luculentum in homine adolescente, febri correpto, cui accesserit diarrhœa cum extremo stupore sensuum. Is cum nihil planè ore haurire vellet, quanquam immoderato æstu totus torresceret, quo humectaretur,

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Now we find if a man in the morning, before he has drank any sort of liquor, and after a perfect evacuation of the urinary vessels, be immersed in a bath, and does not continue many minutes in the water, he shall nevertheless find himself able to discharge urine abundantly when he comes out. There are few people who have not experienced the veracity of this observation.

THE intolerable thirst accompanying an ardent fever is mitigated by immersion of the body in warm water : this is frequently proved by the physicians in Italy, where the practice is much used.

It is very well known that the human body gains a considerable additional weight by bathing in warm or cold water. A man whose weight before immersion doth not exceed 140 pounds, having been fifteen minutes in the bath, after being wiped perfectly dry, shall be found heavier on weighing again by sometimes thirty, sometimes forty ounces, and frequently more.

If a man in extreme thirst immerse himself in water his sensation of thirst is removed, though he does not by the mouth take in a drop of the fluid : therefore it appears that the spongy Absorbency of his own body is the means by which his drought is relieved.

IMMERSION in sea-water is attended with the same refreshing effect, though drinking that fluid be generally apt to cause thirstiness : we may therefore conclude that the particles of salt which give taste to the sea-water, are larger in diameter than the diameters of the absorbent orifices, and that the par-

nectaretur, jubeo in aquam egelidam immergi pedes : quo facto, protinus aquæ mirum cerno in vase decrementum ; deinde ejusdem vix dum coloratæ è vestigio impetuosum, more cataractæ, per anum effusionem. Quæ tamen (sat scio) nunquam isthac sese proruisset foràs, nisi eodem tempore adfuisset diarrhœa. Thom. Simpsoni de Re Medica, dissert. quarta, p. 183, edit. 8vo.

ticles

ticles of liquid in which the salt floats, and is dissolved, are less in diameter than the mouths of the absorbents, and consequently that the skin therefore, like a filter, separates the saline parts from the menstruum which contains them, and imbibes or admits the aqueous element in its pure and divested simplicity, which thereby becomes well adapted to the purposes of the animal œconomy. It is probable that no menstruum whatsoever is so perfect and immediate a solvent for saline bodies as this fluid vehicle of the sea-salt when pure and unmixed. This appears by the great and wonderful benefits derived from sea-bathing, especially in scrophulous or scorbutic disorders. Sea-bathing properly directed gives relief in all the tribe of diseases which are generally allowed to proceed from a redundancy of saline or acrimonious particles floating in the vital juices, or accumulated upon the glands which are appointed to separate them from those fluids, that they may be discharged (their egress being facilitated by that preparatory comminution and previous dissolution in this most convenient aqueous menstruum).

It doth not seem impossible, therefore, that even a dropfy may be cured by sea-bathing; I could produce a striking instance of its efficacy in this disease, were it to my present purpose; a theory might also be advanced, to shew how this disorder may be occasioned by a concretion of saline particles forming obstructions in the urinary emunctories, as founded upon experiment, and careful examination and inspection of hydropical subjects; which concretions dissolving and expelled, the cure is accomplished: but I shall pretermit these disquisitions, my design being only to shew that the body has an absorbent power in a much greater degree than is generally supposed, and to mention how, in some cases, a proper attention to this quality may become extremely useful to mankind.

THERE is not, perhaps, a more terrible calamity incident to the seafaring part of the human race than the extreme want of water: many and very frightful are the effects of this

this unhappy exigence. Who can peruse the accounts mentioned in almost every printed voyage that is published of the sufferings of seamen from this grievous misfortune, without feeling a sympathetic horror and concern at the affecting narrative of the deplorable extremities to which the victims of this disaster are frequently driven? Like a ship on fire at sea they burn in a deluge of surrounding waters: many schemes have therefore been concerted to prevent these miseries by compassionate people, which have as yet, I fear, all proved either ineffectual or impracticable. But though the attempts hitherto made for the attainment of this great and beneficent intention have not been attended with competent success, yet I hope to be pardoned, if from the foregoing considerations and the Absorbency of the human body, which it is presumed they sufficiently demonstrate, I am a little sanguine in my hopes of effectuating the desirable purpose by a method that will appear obvious to all who have attended to those strictures, which, experience will prove, are too perfectly founded in fact to admit of any controversy.

I HOPE it will not be imagined, from the tenor of what is already advanced, that a ship going to sea may be excused its ordinary provision of fresh water, because it is argued that the Absorbency of the human body seems sufficiently able to supply the exigence of it (fresh water) by immersion in the salt element; to advise a step so temerarious and chimerical is very far from my meaning, or the design of these papers, which are alone to shew, that in such unhappy circumstances of extreme want of water, as ships are sometimes reduced to, the burning sensation of violent thirst may be mitigated, the body refreshed, and life preserved, only by the simple expedient of repeated immersion in the sea-water.

THIS doctrine, founded in philosophy, and proved by the most simple and easy experiments, may conduct us to still farther discoveries, and will particularly, it is presumed, de-

termine the controversy which has been so long and variously agitated among the physiologists, concerning the nutrition of the fœtus, as it shews us how the fœtus may be nourished by the colliquamentum in which it is suspended, even though the gullet is unperforated, or the mouth closed, or no entrance opened to the stomach, as has really appeared to be the case in some preternatural productions: and the liquor amnii decreasing as the fœtus grows bigger, evidently proves that it is not nourished through the umbilical vessels, against which mode of accretion many and stronger arguments are advanced by those who oppose this notion *: but as this is not to my present purpose, I shall pass it by, and proceed to shew how this doctrine of Absorbency may be converted to still farther beneficial uses to mankind.

[To be continued.]

Nº XIX.

Extracts from Dr. Hunter's Medical Commentaries,
Part I. Continued from p. 83.

C H A P. VI.

Of the Vessels of Cartilages, and of the Ducts of the
Lachrymal Glands.

DR. MONRO (p. 61.) has given me an opportunity, which I embrace with pleasure, of correcting in print one of my own errors in anatomy. When I was a young man, and a very young anatomist, I wrote a paper concerning Carti-

* It has been found that in some preternatural cases there has been no union of the umbilical cord and placenta; in others it has been tied of a knot; and in an egg there is no communication between the mother and fœtus by any umbilical vessels; and the white of the egg, which answers to the colliquamentum of viviparous animals, is all gone when the chicken is ripened enough to be set at liberty.

lages,

lages, which was published in the Phil. Transf. vol. xlii. In that little essay I advanced that the Vessels of the articulating Cartilages pass secure from friction and pressure between the gristle and the bone: this appearance I saw distinctly in several injected joints; but afterwards I found out that the Vessels which I had seen, did not belong to the superficial cartilaginous crust which remains in the adult, but to what lies immediately under it in growing animals before the ossification is complete. My pupils will bear me witness that I confessed and corrected this error in every course of my lectures; and so far as I know, it was never taken notice of, except by myself, till Professor Monro junior did it that honour, after he had attended my lectures.

I GROW so tired of my author, that I will only add one criticism more; it shall be upon his last chapter, viz. Of the Lachrymal Gland and its Ducts, a new subject, which should not have been brought into the dispute; but by his manner of treating it we see how little he is disposed to do me justice, and how readily he will expose himself to disagreeable suspicions, for the sake of being thought a discoverer in anatomy. He tells us that several of the most celebrated anatomists, particularly Morgagni, Vater, Haller, and Zinn, had exhausted their patience to no purpose in quest of such ducts in the human subject, &c. Then he comes to his discovery, viz. In the summer 1753 (the ever-memorable year still!) he sought after these Ducts, discovered their orifices, and introduced bristles into them, and shewed this to his father, who always mentioned it in his lectures since that time, &c. &c. By this time I fancy none of my readers will be surprized, when I tell them that I had done the same thing, and that I had taught it in every course of lectures ever since the year 1747. If it was necessary to prove a thing so notorious, I could produce many testimonies, particularly that of Mr. Simmons of Exeter, who attended my first course of lectures, and of Dr. Smith of Oxford, who both remember that they saw me introduce

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bristles into the Ducts * of that Gland in the human subject, and that they assisted me in doing it.

Is it not very singular that the young student should have made so many discoveries in the year 1753 at Edinburgh, and that all of them should have been published before that time at my lectures in London? Is it not pretty plain how he came by them, when we are informed that every winter there were some students at Edinburgh who had attended my lectures? And about this very time some of these gentlemen belonged to a society, of which he was a member, instituted by the students for talking and disputing upon medical subjects. Does it not agree with and support this insinuation, that he published such things as his own, after he had heard them from my mouth before a numerous audience, without doing me the justice of putting my name into a marginal note? It would have been but justice, if he had really and truly made the discoveries himself; and if he had, would not he have done so?

AFTER all that has been said and proved, the reader will surely be entertained with our professor's conclusion †, which
I think

* I make no doubt but that all, or much the greatest part of the tears come from the glandula lachrymalis; that they do, and that this Gland, small as it is, can secrete a considerable quantity of liquor in a small space of time, will appear from the following experiment, which my brother exhibited to my satisfaction: he inverted the upper eyelid in a living sheep, and we could distinctly see the tears or water gushing in considerable quantity from the orifices of the Ducts of the Gland. Every time the part was wiped dry, the gush was very manifest; and when it was confined for a moment by pressure, the succeeding gush of water was in greater quantity and more violent.

† " Upon the whole I must conclude, that although in my dissertation on the lymphatics I have referred to almost every author on the subject, the public will allow I have been guilty of no omission in not taking notice of Dr. Hunter, as I have shewn that he did not mention any fact which was not to be met with in common books; that his conclusion from these facts was altogether improper;

I think a specimen of the most easy behaviour under such awkward circumstances that has ever been exhibited to the public.

per; and that he, further, denied the office of absorption to the red veins, contrary to reason and experiment."

"I am hopeful too that the doctor himself, upon considering this, will not only excuse my not having mentioned him, where it could have been so little to his praise, but that he will also think himself obliged to me, that, so far from having industriously sought the occasion of fixing dishonour upon him, I even shunned it when it offered."

"But even upon the supposition that these observations used by Dr. Hunter had not been borrowed, and that his conclusion from them had been well founded, still there was no reason whatever for me to make the least mention of the doctor, as I learned nothing from him: for these and many other observations, with various experiments, were remarked and fully explained, and the conclusion that the lymphatics were a system of absorbents, was drawn from them in my treatise (see the Letters of Doctors Black and Reimarus, &c.) previous to my acquaintance with him, or knowledge of his arguments. Were I, before quitting the subject, in return for the profusion of the doctor's good wishes for my sake, to offer him my best wish, it would be, that he had not attacked me at all; for by that means he has forced me, contrary at least to my intention, if not to my inclination, to bring to light many circumstances necessary for my own defence; from which truth would not allow me to draw conclusions greatly to his honour; and for which therefore he has himself only to reproach."

"If, however, the doctor still perseveres to alledge that his cause is not so desperate as I have represented it, it is to be expected he will endeavour to make this appear in a plain way, by facts well vouched, and conclusions fairly deduced from them."

"For if instead of these he shall answer truth by exclaiming against me for telling it, because it happens to gall him, shall wrangle about words and expressions, shall affect not to comprehend what the rest of the world may think but too plain, shall again insult the patience of the public by making presumptions upon presumptions, confessing at the same time that there is no certain knowledge in the case; in short, shall answer facts by suppositions, arguments and plain conclusions by evasion and perplexity, and an attempt at a sort of wit, which, especially in an affair of this nature, must ever recoil upon him that uses it; the discerning part of the readers, I presume, will allow, that I do the doctor no injustice in concluding that he gives up his cause, and silently avows his conviction; and that he is labouring to raise dust in order to screen himself, and to get off; like what story tells us of some of the combatants of old, who, when worsted, escaped in a cloud."

To the best of my knowledge I have stated the facts with the most perfect regard to truth. Was I in my turn to draw conclusions, I might perhaps be wrong; I will therefore leave that to others, and leave Professor Monro junior to enjoy himself and his discoveries, and to say and to print whatever he may think proper upon this dispute without molestation: he has established a character for ever with me, and I am resolved to take no farther notice of him.

C H A P. VII.

An Examination of what Professor Monro sen. published as a Defence of his Son.

HAVING taken my leave of the son, I find myself under the disagreeable necessity of settling some matters with the father, my old master in anatomy. He took an early part in the dispute as an anonymous author*; and if he had pleaded his son's cause with moderation and candour, he would have shewn a dignity of mind worthy of his years and of his rank in the profession: but this was so far from being the case, that I have the mortification to find him led away by his passions to misrepresent facts, and descend to quibbling in support of his arguments and purposes; and this not only in the first attack, when he was less informed, and his resentment therefore keener, but on many subsequent occasions, as I have been credibly informed, and particularly at his public lectures, when, I should think, he must have known a little more of the grounds of the dispute. It is true, that after what I have said in the former part of this work, it may seem unnecessary to take notice of what the senior professor has advanced in that anonymous performance; yet, there being some indirect accusations in it, which I could not so well bring into the former part, I hope the candid reader will indulge me with a little more of his time and patience.

* Critical Review for Nov. 1757. See Appendix, No. 11.

IN the first seven paragraphs our author gives an historical account of the young professor's discoveries and publications, to shew that he could not have learned any thing concerning the lymphatics from me. I have already given the history of the dispute, with proofs of all the material points; and Professor *Monro sen.* has forfeited all reputation as an historian, by telling us, in the end of the first paragraph, that he knows the facts relating to the present dispute, and sends a fair state of them; and then, by assuring us in the sixth paragraph that Dr. *Monro* went to London in absolute ignorance of Dr. *Hunter's* having any particular opinion concerning lymphatics, attended his lectures, and was surprized when he heard Dr. *Hunter* teach the doctrine of lymphatics being absorbents. Dr. *Black's* letter shews what credit is due to these assertions.

I SHALL therefore pass over this part, and indeed all that is contained in the letter, except the three last paragraphs, which I shall consider under the three following articles.

- I. WHY I do not anticipate others by an early publication.
- II. How far the right belongs to him who first puts a discovery into print.
- III. How far it is true that I have perpetual disputes with *Pott*, *Haller*, *Albinus*, *Monro*, or perhaps twenty more, that will prove very troublesome, and will at last redound very little to my honour.

WHEN Dr. *Monro* asks why I do not anticipate others by an early publication, I own I do not perhaps understand the meaning of the question: if he means to advise me to be silent on any thing which I may think a discovery or improvement, till I have put it into print, lest it should be stolen from me, and occasion a troublesome dispute, I am surely much obliged to him for such affectionate attention to my peace of mind and reputation; but if he means that I should print my observations before I am prepared, I cannot take his advice.

HE that is in a hurry to publish discoveries will often have occasion to repent of his haste. Reflection and more favourable opportunities of making inquiries will at length bring us back to truth, if we have been misled, and will confirm and improve our inventions, if they be right. Had I printed my thoughts about the lymphatics in the first years of my reading lectures, they would have been more imperfect, because the proofs drawn from poisonous absorptions had not then occurred to me; and I am not so partial to the doctrine at this day, as not to see that something still remains to be done. The argument drawn from extravasated fluids passing readily into the lymphatics in dead bodies, is not as yet conclusive, though Dr. Monro has built so much upon it; for in this case there may be ruptures in the lymphatics, and the fluids may get into them by such means, rather than by their absorbing orifices: and this possibility will come nearer to probability, when we reflect that the lacteals cannot, by any means now known, be injected or filled from the cavity of the intestines in the dead body; and if the lymphatics be similar in other respects to the lacteals, we ought to presume they are so likewise at their beginnings or absorbing orifices.

BUT the great thing still wanted upon this subject is, to prove by experiments made on living animals, that the lymphatics do actually and certainly absorb. We must throw milk or other coloured fluids into the chest, abdomen, and into the cellular membrane of the limbs in living animals, and open them after a proper time, in order to see if the lymphatics be actually filled by these fluids. My brother and I have already made several experiments of this kind as occasion offered; but the appearances have not as yet been clear and sufficiently satisfactory: it will likewise be necessary to watch morbid appearances, particularly in glandular diseases, dropsies, emphysemata, and in contusions with extravasated blood. Accurate observations and dissections of that kind would probably throw great light on the subject. By way of illustration

I shall

I shall give a case which will confirm our theory of the lymphatics, and at the same time shew that it may be useful in practice.

IN the spring 1759, a gentleman about forty years of age, who had a very good constitution, and who lived temperately, consulted me about an inguinal tumour. It was manifestly a swelling of one or more of the glands, nearly as big as a pullet's egg, and almost perfectly indolent. It began without any known cause, and increased gradually. Though there was no probability, yet as there was a possibility of some insensible venereal absorption, I advised him to be put into a gentle mercurial course, and to wait the event: the swelling became larger every day, was hardly at all painful, and at length had a plain fluctuation. He was so much afraid of the lancet and caustic, that my brother, who was his surgeon, left it to burst of itself; it did so, and the discharge, which was extraordinarily great, was principally a thin, watery fluid. From the indolence of the tumour, and from the immense discharge for some days, we suspected it might come from the loins, or some other internal part; but upon the most accurate examination which we could make, this did not appear to be the case. His health was otherwise perfectly good; the sore healed slowly and gradually without shewing the least mark of a venereal taint; and the discharge, which was always watery, was in such a quantity, that it wetted through every thing he could cover it with in a very little time, even when the wound was to appearance almost healed: then the discharge became less by degrees, and at last stopped suddenly; the wound closed at the same time, and continued well ever after. But when the water began to flow in less quantity, the limb began to swell; and as the stream from the wound diminished, the bulk of the limb increased: the swelling of the leg was anasarcaous, and it was general, and attended with no pain or inflammation, but with a considerable degree of weakness, weight, numbness, and unsuitness

for motion. His general health was perfectly good, and the other leg quite sound. The nature of the case seemed to be very clear, upon the supposition of lymphatics being absorbents; thus, whatever had been the cause, the glands had been obstructed, and in consequence of the suppuration the principal lymphatics of the limb were so affected, that they could not transmit their contents to the thoracic duct; so that while the wound remained open the absorption went on, and the lymph was discharged that way, as the saliva is sometimes by a wound in the cheek; but as that vent ceased, the absorption was checked, and the whole leg necessarily swelled from the accumulation of extravasated lymph. In this way I explained the case as well as I could to the patient himself, and told him farther, that as the wound had closed of itself, I could not doubt but that some passage still remained open for the lymph, which in time would become more and more free; and that I apprehended nothing more was to be done, but to use a good deal of friction, especially upwards, and when he was in bed to keep his leg higher than the rest of his body: I observed to him likewise, that he might try purging, sweating, diuretics, blisters, fomentations, &c. but that in my opinion he was principally to trust to time and patience.

HOWEVER, I advised him to have a consultation: to make the story short, Dr. Taylor was consulted, and confirmed my opinion, and the event was likewise agreeable to it; for in about six weeks the leg was gradually restored to its full health and vigour.

I HAVE often observed in women who do not give suck, and in nurses after they leave off suckling, that the axillary glands become painful, swell, and sometimes suppurate. Is not this owing to the acrimony which the milk has acquired by long stagnation in the breast, and affecting the gland thro' which it must pass in absorption? I have observed too that they are at the same time liable to little fevers of the intermitting kind, but very irregular in their return, which come on

on with a rigor, and go off with sweat. Are not such fevers raised by the absorption of acrid milk?

In December 1760, a male subject was brought to me, which, from the appearance of the stump, I supposed to have died two, or perhaps three weeks after an amputation below the knee. The flesh of the stump seemed to have been in a bad condition, being putrid, and separating from the bone; the lymphatic glands of that side, at the upper part of the thigh, the groin, and upon the iliac vessels within the abdomen, were much swelled; and two of them, when cut in two, were found completely suppurated; yet in no other part of the body (which was injected and dissected for a demonstration of the blood vessels at my lectures) could we observe the least disorder in the lymphatic system. Was not this disorder of these glands owing to the putrid absorption from the stump? and perhaps, if we had known the circumstances of the case, we should have had reason to believe that this absorption raised and fed the fever which carried off the patient.

DISCOVERIES and improvements in the arts are not commonly brought to any tolerable degree of perfection in a little time; especially when they fall to the share of men who are much employed about other things, and when they require opportunities that seldom happen *; and with the best opportunities,

* For example; I have for many years taught the following new doctrine about luxations, viz. That when a dislocation is produced by violence in an healthy state of the joint, the capsular ligament is always lacerated, not simply stretched: I proved it to be highly probable from the anatomy of the joints, and from experiments made upon dead bodies, and shewed that the difficulty of reduction, in some cases, does not depend on the imaginary contraction of muscles, nor the impossibility, in others, on the imaginary inspissation of the synovia; but that in a simple dislocation the facility or difficulty of reduction may probably arise from the nature of the laceration; and that the impossibility of reducing an old dislocation is owing to the union of all the lacerated with the neighbouring parts. In my lectures I always signified a desire of seeing such

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tunities, and when managed by the ablest man, it has been thought better to throw them out first in a more private way, in order to take the opinion of other people, and hear the reasoning of those whose prejudices may balance the partiality of an author. The great Harvey proceeded upon this cautious plan in the discovery of the circulation *: when Professor Monro recommends examples, does he think there is any one more respectable?

ANOTHER thing that kept me from writing upon the lymphatics, and upon some other subjects too, was the want of leisure to examine what had been already said of them by authors of reputation. If a man writes freely upon any subject, without knowing what has been said by others, he risks

cases; Mr. Gataker was kind enough, some years ago, to gratify my curiosity upon one such occasion; and Mr. Thomson lately did me that favour in a case that proved, in a most satisfactory manner, every circumstance which I had advanced, at least as far as one case could prove any general doctrine. Surely, men of sense must think that it was right to give my thoughts and observations upon this subject at my lectures; it was doing justice to my pupils to give them every idea, however imperfect, that might be useful to them in their profession. Accordingly Mr. White of Manchester, soon after he had attended my lectures, applied this doctrine to practice in treating dislocations, and with great success, as appears by his paper in the second volume of Medical Observations, published at London; and in the letter which accompanied that paper, he did me all the justice that I could expect.

On the other hand, whatever may be Dr. Monro's opinion, I cannot but think it was right to suspend being an author upon this subject, till I had actually dissected some cases of dislocations, and could prove the doctrine in a more unexceptionable manner. At length this doctrine has been published with advantage in the same volume by Mr. Thomson, who had too much sense and too much candour to suppress my name. But still it will be necessary to examine a number of cases before it can be known with certainty, whether the doctrine be in general well or ill founded; and probably it will require the examination of a great variety of cases to explain the various circumstances which may occasion particular exceptions to the more general rule.

* See his Dedication to the College; "*Meam de motu & usu cordis & circuitu sanguinis sententiam, E. D. D. antea sapius in prælectionibus meis anatomicis aperui novam, &c.*"

being

being made the object of ridicule or censure. I have several times met with my own observations in books, after having long believed them peculiar to myself: it must be the case with every man who is more entertained with nature than with books. The present dispute has given me a fresh instance of it.

GLISSON having been quoted, I considered what he had advanced upon this subject, and had the pleasure and mortification to find that he gave † exactly the same account, both of transfusion and of absorption; so that I can no longer call it, what I really believed it to be, a new opinion, but Glisson's revived and confirmed; for in him it was mere opinion, and accordingly was overlooked or rejected by his successors, as happened to the doctrine of the circulation in the writings of Servetus and Cæsalpinus.

I COME next to consider our author's sentiments as to this question, How far the right belongs to him who first puts a discovery into print? I know of no act of parliament indeed about the matter, but will venture to say, that all men will think alike upon the question; and I cannot drop the subject without smiling at the weakness of quoting precedents for establishing injustice.

I AM come to the last article, and every thing is of a-piece. "Perpetual disputes with Pott, Haller, Albinus, Monro, or perhaps twenty more, will prove very troublesome, and will at last redound very little to his honour."

PROFESSOR Monro has been pleased to put his son into very good company; but he must give me leave to make some distinction. Pray, how came the names of Haller and Albinus here? two names respected by all the world, and by nobody more than myself. To mortify me still more, he might

† Anat. Hepat. Lond. 1654, pag. 402, 448, & 456.

have added Morgagni and Winslow, and then every body that does not know me would have supposed that I had treated all these great men in a manner very unbecoming one who professes himself to be their admirer, not their rival. If in a few instances I have ventured to dissent from such great authorities, my dissent proceeded from nothing but freedom of inquiry and conviction of mind; surely then, if Professor Monro alludes to any thing of this kind, he does me an injury. Baron Haller and Professor Albinus, ever diligent and successful in study, have, in their late publications, anticipated me in some things; I have said so in my public lectures, where it was well known what doctrines I had taught, and how long I had taught them; but I never made a dispute of these things with them, nor they with me; and I never did accuse either of them of treating me unfairly in any sense, nor ever had reason to think that either of them had done so. If then Professor Monro alludes to these anticipations, when he draws and publishes a character with such freedom, he certainly acts unjustly. When I think of this, and of his years, I feel something different from resentment, and would therefore wish to have done with him; but, in justice to myself, I must give an account of some parts of my lectures, which misrepresentation might still dispute, and which, I presume, were pointed at by Professor Monro senior.

THUS far is necessary, that our readers may be perfectly informed with respect to Dr. Hunter's part of the contest betwixt himself and the two Monros. His eighth chapter is upon the discovery of the membrana pupillaris and the insensibility of the tendons; of which see Med. Museum, vol. I. p. 214.

His ninth chapter is of the rupture in which the testis is in contact with the intestine; to this are added observations on the state of the testis in the foetus, and on the hernia congenita, by Mr. John Hunter; which we may give hereafter.

To this work is subjoined an appendix, containing what was published in the Critical Review before Dr. Alexander Monro jun. wrote his *Essays Anatomical and Physiological, &c.*

N° XX.

An expostulatory Epistle, to William Hunter, M. D.

S I R,

DISAPPOINTMENTS, it seems, must be met with in every stage of life. I had flattered myself, that being now in less hurry of business than formerly, and having the assistance of my son, I might sometimes enjoy the conversation of my friends, and pursue as much of the practice of medicine, as did not require fatigue, but would rather add to the sweets of a calm retreat. It was really cruel in you to force me to resume the pen, especially in controversy, which I always dislike so much, that I never was the aggressor. You must have been conscious of this, by seeing that I did not claim what of my performances you assumed to yourself, or published without acknowledging such things ever to have been mentioned by any other person*. But your late attack in your medical commentary on my candour and veracity, the part of my character which I always valued most, piques me so much, that I must appeal to the public for redress; and

* Dr. Hunter, in his paper on Aneurisms (London Medic. Ess. & Inq. vol. i. art. 27.) aims to criticise my doctrine on the same subject (Edin. Ess. & Obs. vol. ii. art. 16.) but makes no acknowledgment of borrowing his species of aneurisms, and a principal part of the operation for the cure of that disease, from me. He has however been very favourable in his opposition; for there is scarcely a remark in which I cannot shew faults in facts or argument, unless where he evidently borrows without owning by whom he was benefited. If the doctor doubts this my assertion, he may soon see it; for the manuscript is ready for the press.

possibly when the spirit is thus roused, something more than my vindication may appear.

IN p. 56. of your commentary, you introduce the quotation of my words with, "Professor Monro senior, has forfeited all reputation as an historian, by telling us;" and after your quotation, you add, "Dr. Black's letter shews what credit is due to these assertions."—In p. 25, you exclaim, "Mercy upon us! Did professor Monro senior, really know how things were, and make this public declaration?"—Those words are interpreted by your readers as a direct accusation of my having asserted a falsehood, knowing it to be such.—But you may possibly pretend, that, by having graciously pleased to say,— "You cannot with any decency suppose, but that my son concealed from me that he knew your opinion of the lymphatics;" your words should not be thought to imply such a strong accusation as is alledged.—The answer they give is, that your saying plainly in p. 56, "I egregiously misrepresent facts;"—your introducing a subject entirely foreign to the purpose of that part of this commentary, and which is proposed to be fully treated in your next one, with the plain and sole intention of endeavouring to shew my falsehood in quotations, and many artful insinuations of the like nature, must persuade every one that your design was to represent me as a wilful liar and deceiver, however smooth and couched your words are:—Since there is not the most distant insinuation in the declarations of your numerous witnesses, that I was guilty of such falsehood as you accuse me of in the pages quoted, you shall have the only remaining mean of proof, my oath, if you require it That, before my son, the young professor, went to London, I had not the least knowledge of Dr. Hunter's having ever demonstrated injected seminal tubes, or of his having taught any thing particular relating to the lymphatic vessels as absorbents.—Nay, I shall surprise you more, Sir, when I assure you, that I had made no inquiry about your proceedings. Information from scholars, which you let

us know you dealt in, seemed to me very unfair and uncertain; and the first fruits of your labours, when published*, gave me no such curiosity as could tempt me to act a part I did not approve:

My son will probably inform you what the reasons of his conduct were; and you have published a sufficient one, to wit, Dr. Black's declaring, that he does not remember his having made mention to my son of your knowing any thing of lymphatics, till after reading my son's treatise on that subject; and till then, was not master of many arguments in support of your opinion, which, notwithstanding the publications boasted of, was unknown, or so much disregarded at London, that there is not the least notice taken of it in any one book published there during the period of time in which these publications of Dr. Hunter are said to have been made, though the subjects treated by several writers (Laurence, Douglas, Jenty, &c.) led them to have mentioned it.—Nay, Akenfide, who argues for lymphatics being absorbents from the analogy of the lacteal vessels (Phil. Transf. vol. i. p. 1. § 40.) does not give the smallest hint, that in 1755, he knew any who pretended to maintain this doctrine.

THE next falsehood you attribute (p. 52.) to me is, That, in the dispute with Dr. Noortwyk, to give my argument some plausibility, I had egregiously misrepresented the doctor, by substituting one word for another of a quite different meaning in two of my quotations, and in a third, I have coined a whole sentence; to which you add, &c. &c. to insinuate, that there are a great number of such misinterpretations.—To make this heavy charge evident to your readers, the words

* An account of the structure and diseases of articulating cartilages, by William Hunter, surgeon (Philos. Transf. N° 470. § 6. for April, May, 1743.) where, after a pompous introduction, which raises high expectation of novelties, I found nothing that I had not seen in books, except several mistakes. Of this the proof-lies also now before me.

challenged might have been quoted; but I suppose you think none can doubt of what a person of your perfection pronounces. With great submission, however, I must take leave to examine this libel; and to explain it to the reader, must give a short account of the dispute between Noortwyk and me.

IN § 16. of the preliminary facts of my essay on the nutrition of *foetuses* (Edin. Ess. & Obs. vol. ii. art. 9.) I had endeavoured to shew, that there is no anastomosis, inosculation, or continuation between the vessels of the womb and those of the *secundines*; and therefore, that the liquors are not carried from the mother to the *foetus*, or from the *foetus* to the mother by continued canals, but the extremities of the umbilical vein take up the liquors by absorption, in the same way as the lacteal vessels do in the guts, and the umbilical arteries pour their liquors into the large cavities of the sinuses or other cavities of the womb analogous to them.—Several years after the publication of these essays, Dr. Noortwyk, a learned and candid Dutch physician, published his elaborate *Uteri humani gravidi Anatome et Historia*, in which he endeavours to refute the doctrine just now mentioned, and to prove that there is an inosculation or continuation of the vessels of the womb with those of the *secundines*.—It was therefore judged necessary, that I should examine Dr. Noortwyk's arguments in the subsequent edition of the essays; but as the facts and reasoning relating to this subject were interspersed with the other parts of his treatise, I was obliged to make excerpts of what related only to our dispute, omitting what did not regard it; and it behoved me to connect these excerpts the best way I could.—In doing this, it was impossible to keep to a literal translation of his words; and therefore, by putting the mark of quotation to these extracts, I could mean no more than to distinguish his sentiments and observations from my own.—If I have represented his facts or arguments, so as to lead to conclusions different from what the genuine sense of his words would allow, I ought justly to be condemned, and severely censured; but if

no such fault is to be found, I leave the world to judge what part you have acted, who have forced in a subject absolutely foreign to the rest of your work, and which is promised to be particularly treated in your next commentary, with the sole view of unjustly accusing your old master of gross falsehood.

To shew that my translation of Dr. Noortwyk's words was not literal, without changing his sentiments or representations of facts, I shall here quote verbatim some sentences of the original Latin, and of my translation.—“ Ante aliquot annos,” formerly—“ neque ego in funem aut foetum penetra-
“ veram,” the injection into the impregnated womb did not penetrate into the foetus or umbilical rope—“ interim aliquando ex certis vasorum conditionibus cohiberi injectam materiam ne per vasa respondentia transeat, docet mirabilis testiculorum masculinorum fabrica. Potuit Ruyschius”—injections do not always pass where there is a continuation of vessels; thus for example Ruysch—“ Arteriolæ vasculis femi-
“ nariis decuplo minores,” the tubes ten times larger than the injected arteries. — There are several more such, so evidently in the meaning of the author, though not in a literal translation of his words, that I must think even you, Sir, will not alledge that I have thereby falsified or misrepresented his sense.

POSSIBLY the whole sentence which I am said to have coined, is the following, where there are English words, to which there are no corresponding Latin ones, in the place where you have happened to look into Noortwyk's book:

THE Placenta consists of a great many knobs, between which the membrane (the exterior Lamella of the chorion) is inserted, as the pia mater is between the convolutions of the brain, and the soft,

PLACENTA jugis exsurgentibus natifque hinc sulcis tota inæqualis—singulis jugis illa chorii productio supertendebatur, spatiis quoque mediis intermissa, quemadmodum pia mater non modo convexos col-

spongy, internal surface of the womb is insinuated into the furrows between these knobs. *liculos cerebri vestit, sed et fissuris ejus se insinuat.*

I SUPPOSE you judged the above quoted English sentences to be my coinage; but if you had consulted and understood the author, you would have found words equivalent to mine in more than one part of his book, such as you see added in the column opposed to this.

Ex his conclusi ambitum ovi utero ubivis adnexum esse ope vasorum et cellulosa substantia.

Cujus (cellulosa substantia) ope universa ovi superficies utero cohærebat quam posset proxime, ita ut elevata matricis substantia, nulla divisionis nota pateret sensui.

"UBIVIS adnexum" and "nulla divisionis nota," could not be without the insinuation of the cellular substance into the furrows; and therefore to every reader who knows this subject, no misrepresentation can appear in this part of my quotation.

I MUST next guess which are the words of a quite different meaning from the authors, which I have substituted. Perhaps the sentence already quoted, "*Arteriolæ vasculis seminariis decuplo minores*, the tubes ten times larger than the injected arteries," may be said to have "injected" added, to have tubes where arteries should be, and arteries where tubes are, and "minores" translated "larger" instead of "lesser." Though every school-boy would be affronted at an allegation of his thinking so; yet from some things soon to be taken notice of, it is not impossible, that the Latin sentence just now quoted was intended as an example of my faulty translation.—I shall however suppose, that the two words challenged, are "proxime" and "solvebatur," the former of which is translated by me "strongly," and the latter "broken;" whereas you may think that the translation should have been "closely"

“closely” and “loosened.”—My reason for taking these words of Dr. Noortwyk in the sense I have done was, that he had described the connection of the womb and secundines, as being much stronger than others had done, or I had seen it; and by the motion of his knife backwards and forwards, such tender injected vessels would more readily be broken than loosened from each other, in their interlaced state.—But what might have convinced every judge of such matters, that no injustice was here done, is, that my translation of these words, and the sentence which you imagined I had interpolated, gives greater force to Dr. Noortwyk’s argument, than it would otherwise have; for the placenta and womb being every where applied and adhering strongly to each other, and the vessels breaking on attempting their separation, makes a greater presumption of the continuation of the vessels from the one to the other, than if there had been void spaces any where between them, and the vessels had loosened from each other without breaking, on separating these two bodies.—So far then have I been from misrepresentations which give some plausibility to my argument, that, on the contrary, I have interpreted his words in the most favourable way for his argument, which is the side I would always prefer, where there is any ambiguity.

If you pretend that I have mistaken as to the sentence and words you allude to in your libel of falsehood against me, I expect, nay, I think I have a right to demand, that you will inform the public what they are, that I may either give my reasons for the difference you imagine there is between Dr. Noortwyk’s text and my translation, or acknowledge my fault, and ask Dr. Noortwyk’s pardon.

NOTWITHSTANDING your approbation of Dr. Noortwyk’s preparation and sentiments, I still think the reasons I gave for a mistake in the preparation, and its being no proof of an anastomosis or continuation of the vessels of the womb
and

and secundines, were well founded *; nay, from the little you have said of your own preparation of these parts, and the confutation of me, which you propose, by comparing the uterine vessels entering the placenta, to the mesenteric vessels going into the intestines, you confirm my doctrine, and I shall probably use your own words, as an additional proof of it, in the next edition of the Edinburgh Essays and Observations.

AT the distance of very few lines in the same paragraph, where I am accused of interpolating a sentence, and putting quite a different meaning to words than they ought to have, you, Sir, affirm, that from quicksilver poured into the uterine vessels not filling any vessels of the placenta of a gravid bitch, I conclude, that, in that animal, the uterine vessels do not ramify through the placenta; whereas my words are "therefore" concluded, that no mercury had passed from the uterus into "the umbilical vessels."—If you at all understood the subject of dispute between Dr. Noortwyk and me, you should know that these two conclusions are very different; and I shall be so much your friend, as to inform you, that though you could shew five millions of ramifications of uterine vessels through the placenta of different animals, you are not a whit nearer refuting my doctrine, unless your injection also fills the umbilical vessels.—If you pretend to this, I warn you to be as cautious of avoiding any appearance of fraud, as the candid learned Noortwyk is.

THE roguery of the old man being thus discussed, the imputation of inconsistency, folly, and dissingenuity must next be inquired into, as they are represented in page 20, of your commentary. After a soothing compliment to him, we are told, that he wrote on injections and preparations,—had almost none or very few—undervalued preparations, and insinuated

* The reader who wishes to form a judgment about this question, is intreated to take the trouble of reading the paper in the medical essays above referred to,

that

that they were of no use;—but now he speaks of them with temper and moderation, and his son has been much employed in making them.—So you represent me, but how justly, will appear evidently on reciting plainly the facts.

IN 1732, a paper of mine on injections was published in vol. i. of Med. Ess.—In 1734, vol. iii. contained one on preparations.—In 1747, I wrote a treatise on the method of dissecting and making preparations for a regular course of anatomy.—After 1758, I gave no lectures on preparations and injections.—Since ever I began to teach, which is more than forty years ago, I illustrated the structure of most organs of the body by preparations, in every course of anatomy which I gave.—Is this consistent with no or very few preparations—insinuating they were of no use—now speaking of them with temper?—or how could I be supposed to insinuate that preparations were of no use, when I had declared so publicly for them,—wrote a treatise long after to instruct my sons how they were to be made, and used them regularly in my demonstrations of every course?—Oh! I beg pardon, you have inserted a salvo, to wit, if you understood me right.—Most thankful ought I to be, that I am not answerable for your understanding.—I cannot at present recollect any circumstance which could afford the least handle for your present misunderstanding, unless the caution I gave the students who attended me, always to consider what change the method of preparing the organs could make on their shape, size, solidity, &c. the neglect of which circumstances had misled several, otherwise good and candid anatomists; and, at the same time, I shewed examples of the changes made on the parts by different methods of preparing them.—The publication of the arts of injection and of preparing the organs of the body, so far as I then knew of them, appeared to many to be disinterested, as the few then acquainted with them kept them a profound secret; and I believed that more hands being employed in unravelling the texture of animals, would sooner make it
to

to be better and more generally known. I did not imagine, that I could thereby give offence to any, except those who had a view of more purchasers of these arts, and at a higher price, than they could have, if so much of them had not been published.

My advice of publishing speedily what discoveries you had made, rather than delay these publications, till you bring your discoveries to perfection, you seem to despise (p. 57.) but I assure you that many think it was prudent, and you should have followed it, because you might perhaps thereby have been kept free of many disputes, which you must otherwise be exposed to, and are more and more immersing yourself into.

AMONG those whom I foresaw at the time of writing my letter, you was to have disputes with, I named Haller, Albinus, and my son.—This you think (p. 61.) was to bring my son into good company, which is a very natural reason from you, who have humbly condescended to take only one companion; but he is no less than the immortal Dr. William Harvey, the inventor of the circulation of the blood, and the writer of one of the best treatises we yet have on the generation of animals.—You see I am still in the practice of exhibiting the characters of anatomists.—You seem, however, not to conclude my son's honour to be my sole reason; you conjecture that I had been informed of the subjects of competition between you and the two learned professors contained in your commentary.—Neither of your conjectures happen to be right: for the truth is, that at the time when I wrote the letter on which you comment, I was intirely ignorant of your having any pretensions to the discoveries or improvements mentioned in the commentary; but I had seen in your *Primitiæ* (Phil. Transf. No. 470.) what Albinus (*Icon. Off. Foet*) had already published, and I had then read, in the *Crit. Rev.* for March 1757, your claim to what I knew to be Haller's discovery of the pro-

cess of the peritoneum, to which the frequency of the hernia congenita is owing, and thence I concluded, that as the two learned professors were from time to time instructing us by their publications in books dispersed all over Europe, you would form some pretext of bringing your publications (a name with which you are pleased to dignify your private lectures to students) into a competition with them, and you, or, which is the same thing, your obsequious friends the Critical Reviewers, had declared your rivalry to my son.

You add, that, to mortify you still more, I might have added Morgagni and Winslow to Haller and Albinus.—Do you really not know that Morgagni and Winslow's works were published long before you could possibly have a title to any competition with them? that these two great improvers of anatomy had long deserted the practical part of this science, and that one of them, the honest worthy Winslow, is dead?—But even as to them, I see, in some dissertations of your scholars, things attributed to Dr. Hunter, which are to be found in the books of these authors. A pretty sure index of what passed in these private publications.

You tell us, you “cannot drop the subject, without smiling “at the weakness of quoting precedents for establishing in- “justice.”—I shall not attribute this interpretation to malevolence and ignorance, the two motives which you more than once upbraid me with; but desire every reader of common understanding to examine my words, and from thence to determine, whether the obvious meaning of them is not that Rudbeck and Horn, have lost the honour they pretended to, by being later in their publications than their rivals; and therefore, I gave you a prudent, and some even say, a friendly advice, in prompting you to prevent such a misfortune to yourself.

THE chapter viii. of your commentary, which immediately follows your examination of my letter, confirms most conspicuously what I had said of your being in the high-road to perpetual wrangling, and how little you acknowledge to have learned from others.—You have directly come into competition with Haller, Albinus, &c. who probably will not think the fulsome flattery you bestow on them sufficient compensation for your attempt to be joined with them in any *Historia anatomica* of discoveries.—Nor will Whytt, Reymarus, &c. who endeavoured several years ago to refute the learned Haller's doctrine of the insensibility of the membranous, tendinous, and ligamentous parts of the body, readily accept you as their coadjutor, on account of the remarks now added in contradiction to the glory you aimed at, by alledging, that you had preceded Haller in maintaining the insensibility of these parts.

You should have also considered, that the authenticity of the super-eminent evidence of all your transactions, to wit, the manuscript which you had of your lectures, appears in great danger, from those remarks, from the testimonies you have brought of the progress you had made in the doctrine of lymphatics, and from almost every article where you appeal to it: for, from these it is evident, that most of what you would have us to think is there wrote, must have been inserted much later than is convenient for your purpose that we should believe.—But, as I am mentioned only in relation to one point, I shall pass all the others at present, and confine myself entirely to it.

“ AMONG the authors (say you, p. 64.) who suppose the
 “ periosteum to be extremely sensible, and therefore plenti-
 “ fully supplied with nerves, Professor Monro senior might be
 “ mentioned; and sometimes you did mention him.”—To
 shew the candour of this quotation, and the aim of the sub-
 sequent doctrine, it may be necessary to consider my words,
 which are the following (p. 3. of the *Anatomy of the Hu-*
 man

man Bones) “ The great sensibility of the periosteum in the
 “ deep-seated species of paronychia, in exostoses, nodi, tophi,
 “ and gummata, from a lues venerea, or whenever this mem-
 “ brane is in an inflamed state, is a sufficient proof, that it is
 “ well provided with nerves, though they are too small to be
 “ traced upon it; and therefore one cannot well determine,
 “ whether they are sent along with the arteries in the common
 “ way, or are derived from the tendinous fibres of the muscles
 “ expanded on the periosteum.”—It is plain that I here put
 the proof of nerves furnished to the periosteum on the sensibility
 of this membrane in diseases, which strongly implies its little
 sensibility in a sound state; whereas you, Sir, are pleased to
 give what you would have believed to be my sentiment, in
 words expressing its being extremely sensible in all states; and
 your intention is further evident by the argument you use
 against the sensibility, “ patients not seeming to be at all in
 “ pain,” when the periosteum was cut or scraped in many
 operations.—You see I admit in my text, the nerves not being
 hitherto traced on the periosteum; and, in my commentary on
 this paragraph, I always mentioned patients not generally com-
 plaining of their pain being increased, when this membrane
 was cut or scraped in amputations and trepanning; but would
 not chuse to say as you do, “ they did not seem to be at all in
 “ pain.”—When, in p. 65. you attempt to refute the argu-
 ment for the sensibility of the periosteum from what is felt in
 diseases, you are superlatively curious. Your words are, “ The
 “ argument taken from the excruciating pain in some nodes, is
 “ inconclusive, as we frequently see large ones that are per-
 “ fectly indolent.” If this is good logic, then the skin is an
 insensible part too; for frequently in gangrenes, palsies, &c. it
 is perfectly indolent.

AMONG the uses of the periosteum, I mentioned its sensibi-
 lity being capable of making it serve to warn us of injuries
 which insensible bones might suffer without our knowledge, or
 endeavouring to procure a remedy.—You think the skin may

sufficiently serve this purpose, and keep us from wantonly bruising and breaking our own bones.—Alas, Doctor! how is the skin to preserve a bone from being destroyed by acrid matter collected between the periosteum and it, without any previous external injury, which I have often seen? I fancy, if this was your own case, you would be very thankful that the periosteum, by pinching or galling you, led a skilful surgeon to the proper cure, to wit, to let out this matter before it had eroded the bone.

HAVING thus endeavoured to exculpate myself from wilful lying and falshood—from coining and egregiously misrepresenting—from inconsistency, folly, and dissingenuity—from giving bad advice, and from ignorance imputed to me; I would next wish to have my curiosity satisfied. Pray, good Doctor, what is the “something different from resentment,” which my advice, called by you, p. 62. “injustice,” and “my age,” make you feel?—Gratitude is too unfashionable an affection of the mind, to impute to polite gentlemen.—Such may endeavour to expose to ridicule an old master, or a deceased benefactor and friend.—They may depreciate and prevent the sale of the goods of their first introducer into business, by shewing a sample of better stuff, and promising that all their future manufactory was to be equal to the sample, though conscious that a shop for sale of their own goods could not be opened till after many years; and therefore I shall not be ill-mannered enough to interpret your sentiments to be of the old-fashioned stamp.—I am afraid those who read your performance won’t allow me to call it the effects of generosity, charity, or reverence; possibly you mean, that you feel contempt for a doctard, “whom (you say) you wish to have done with,” which in a charitable construction, may be to wish him in Abraham’s bosom; for which good wish, your old master returns you thanks, and shall “at present have done with you,” after giving a friendly advice to you, and an exhortation to the students of anatomy.

IN your publications to students, or to the world, do not pretend to perfection; for man must err;—and some may think, that even in this paper, you may have conviction enough to make you join with old Terence, in acknowledging, “*hu-
mani nihil à me alienum puto* ;” or, if this is not sufficient, expect to see numerous other examples of fallibility. Avoid serious argumentation, and a show of learning; for, be assured of it, that an examination of either will redound little to your honour.—A joke may sometimes pass for demonstration, and if it is of the sarcastical kind, may please a young audience; but remember, that indulging this sort of humour frequently, though one is ever so confident of having smooth, artful, ambiguous words always at command, will create a grudge in the hearts of all good-natured people against the sly back-biter.—You will give less offence, by speaking in plain contradiction to those you have occasion to dispute with, as you see the blunt, testy, old fellow, you are now engaged with, has done.—When you mention cases of patients, be so explicit in their history, that some judgment may be formed of the nature of their diseases, in which you have indeed, Doctor, been hitherto very negligent. I hope you will think it for the advantage of the public, that the truth be a little more expiscated.—Use your influence, which seems to be unlimited, with your anonymous friends, not to publish any thing relating to you, till you have revised and approved it; for at present, what they say is believed and held as proceeding from you. This, you know, is giving your adversaries too much advantage.

GENTLEMEN STUDENTS, remember that it is the structure of the body which you ought to study; to it therefore attend, and do not let the admiration of the apparatus, with which it is displayed, divert you from a strict examination of the parts exhibited to you.—Preparations for unravelling and observing the minute and intricate texture of the several organs, are absolutely necessary in a course of anatomy, and should be

carefully examined. In doing this, endeavour to know what art has been employed in making each, and what effect that art may have in changing any of it from the natural appearance.—Consider well the reasons advanced in support of each point of doctrine you read or hear, and be determined in your judgments by force of experiments, or of arguments, without regard to any other person's way of thinking on the subject.—Suspect whatever is said in couched ambiguous words, and try what different senses they can admit of, chusing that which appears most reasonable to you, though the speaker or writer seems to wish to lead you to a different conclusion.

I am,

Your old Master,

Edinb. Sept. 8, 1762.

ALEX. MONRO.

N° XXI.

A Medical Question proposed, and answered.

SINCE nothing enters into the blood but a white milky liquor, called chyle, how comes it to be thus changed, and the blood to be of a red colour?

ANSWER. Colours of all sorts depend upon the surfaces of bodies, which are of different colours as they reflect the rays of light falling on them in different manners.

THE chyle passes from the intestines through the lacteal vessels into the receptacle of the chyle, situated just under the left kidney; hence it passes up the thoracic duct, and enters into the left subclavian vein, where it mixes with the blood, and is conveyed first to the right auricle, and thence to the right ventricle of the heart: in all this progress it acquires

no redness, except what it gains by mixing with the blood already red, which it renders paler by its mixture. From the right ventricle of the heart the fresh chyle is protruded into the lungs, and the moment it passes through them it acquires a vivid redness; of which we are now to search the cause.

ANATOMISTS know that the blood, whilst in the lungs, suffers a prodigious pressure from the weight and elasticity of the air taken in at every inspiration, which must have great effects, and considerably alter the texture of it. But it is not so universally allowed that the air mixes with the blood; however, I am inclined to believe and to suppose, that some part of the air does actually mix with the blood, and impart to it its red colour. The part I mean is that acid with which the air abounds, especially in healthy seasons, which acid, as it is very subtil and penetrating, may enter the pores of the vessels in the lungs and mix with the blood in order to this effect. My reasons are these (though I own the matter does not admit of demonstration):

I. ALL animals, to whom respiration is necessary, inclosed in a place that has no communication with the open air, soon breathe with difficulty, and die; mean time the air loses a considerable part of its elasticity, which I suppose happens, because the acid of the air is wasted by repeated inspirations, and then the air, thus deprived of its acid, is no longer fit for respiration, as it can communicate no more acid to the blood by the lungs.

II. In very hot moist weather most people feel a heaviness and a degree of difficulty in breathing; and it is well known to philosophers, that in such seasons the air abounds less with an acid than at other times; it is also observable, that in such constitutions of the air the blood is subject to have its texture dissolved: now acids are known to preserve the texture thereof.

III. THE

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III. THE blood is not the only fluid which acids make red ; for acids mixed with syrup of violets, and many other vegetable juices, turn them red. Most aromatic oils become red upon being exposed to the air a little time ; and, indeed, it seems to be the property of acids to impart a redness to animal and vegetable substances : thus, the acid of salt-petre, which once floated in the air, makes dry flesh very red, and therefore is used in preserving hams, beef, &c. The acid smoak of wood will have the same effect on flesh, and make it intensely red ; and it is worth observation, that the scarlet-dyers cannot strike their colours without the help of an acid.

FROM these considerations I conclude, that the blood owes its red colour to the acid which it borrows from the air, and which mixes with it in the lungs.

Nº XXII.

Observations on Scirrhuses of the Cerebrum and Cerebellum.

[Translated from the original Latin of John Godfrey Zinn, from the Commentary of the Royal Society of Gottingen, tom. ii. 1752.]

I HAVE now seen two cases of Scirrhuses in the Cerebrum in different infants, disordered by obstructions of the conglobate glands. The first of these instances, of which I was a spectator, happened three years ago : in this infant the scirrhous was the bigness of a walnut, of which I did not take a very accurate description. The other case which I observed is this : A portion of the Cerebrum on the left side was degenerated into five scirrhous tumours, weighing at least two ounces, adhering together, hard, yellow, and very much resembling the conglobate glands in a scirrhous condition. In some parts

parts one might still perceive remains of the annulæ of the coat of the Cerebellum, which in other places were quite effaced; so that it was an uniform, inorganical mass. The pia mater parted from the scirrhous substance, dissolved in the liquid wherein it was preserved, and, being at liberty, fluctuated; but in the middle, where the scirrhous was the thickest, it was so connected with the dura mater, that it could hardly be separated without violence: the neighbouring vessels of the pia mater were turgid, and filled with blood. All the conglomerate glands of the body, as I very well remember, were in a state of perfect health.

I saw three scirrhuses of the cervicial cortex, in an adult woman, under the parietal bone, each of which was as big as a nutmeg. The scirrhous parts were so concreted with the dura mater, which was much thicker in that part, that they could not be separated; and the parietal bone, by the protuberance of them, was in that place so excavated to receive them into its concavity, that it was attenuated to the thinness of paper.

N° XXIII.

An Account of the Success of Mons. Daviel's Method of extracting Cataracts.

In a Letter to James Parsons, M. D. F. R. S. from Andrew Cantwell, M. D.

S I R,

AS my last public course of operations made in the amphitheatre of our schools, especially the lessons I pronounced there on the distemper of the eyes, procured me, since that time, frequent occasions of seeing all our famous oculists extract the cataract, and making with them several re-

marks on that disorder, I take the liberty to communicate them to the Royal Society, if they have not as yet come to your knowledge.

THE extraction of the crystalline from the posterior chamber, by an incision made in the cornea, with a design to cure the cataract, seems to have been first attempted by M. Daviel. It is true, Surgeon Petit, and the Oculist St. Ives, extracted it out of the anterior chamber in 1708, and the following years; but that operation was designed only to rid this chamber of an accidental burden fallen into it in couching the cataract; and it is very reasonable to believe it was only the examples of these two operators led Daviel into this new method, which has wonderfully facilitated the cure of that disorder, and cleared up the many difficulties that appeared in it hitherto.

THE Greeks and Arabians looked on the glaucoma as an incurable cataract; and the moderns pretended that the incurability proceeded from the nature of some other distemper complicated with the cataract. It was hard to tell why, the cataract once couched, the patient should remain blind, or why it should rise again into its place.

THIS new operation shews us, that not only the crystalline, but even sometimes its capsula, and sometimes only the anterior membrane of this bag, are opaque, sometimes adherent to, sometimes separated from, the body of the crystalline.

SOMETIMES the anterior membrane of this bag has been found opaque, and the crystalline transparent; and in all these cases the patients have recovered their sight.

DR. Fallon, the bearer of this letter, has assisted with me at a very difficult operation of the cataract, and is to present you a small box, in which are three packets.

Nº I. contains a portion of the anterior membrane of the capsula crystallini; this humour, being still transparent, was left untouched: the patient saw perfectly well after the operation.

Nº II. contains an opaque crystalline and a portion of the anterior side of its bag, quite opaque: the patient recovered his sight.

Nº III. contains the whole bag and crystalline, extracted the fourteenth of this month: it was adherent to the posterior and superior side of the iris; and was quite whole and plump when drawn out.

IN this last case it commonly happens, that some portion of the vitreous humour follows; sometimes it mixes with the aqueous, and comes off with it; sometimes the eye appears quite sunk; and sometimes the vitreous humour filling, as it were, the posterior chamber, makes the iris bulge forwards, and appear prominent upon it, the whole together resembling a kind of hernia. These two last cases require a nice and prudent hand; the prominent vitreous humour is to be cut off in two or three days after the operation, the eye then banded, but not compressed, and the patient laid on his bed, the head lower than usual, till the rest of the vitreous humour gets back into its cells, and remains there. This we have seen examples of; the vitreous humour regenerates, and, though a great portion of it be lost, it is supplied again, sooner or later, and the patient recovers his sight.

I SAW Daviel extract the crystalline quite opaque, with its whole bag adherent to it; and this bag I dissected from it, after the operation was over.

IN the operation of the fourteenth instant the crystalline, in its whole bag, made one intire spheroid, soft and plump; but it is already broke and dry.

BLUE eyes are most subject to the cataract, and black ones to the amaurosis: in these the ciliary nerves and fibres are always weak; in those, strong and elastic.

1. A CRYSTALLINE couched, if the capsula be opaque, leaves the patient blind.

2. A CRYSTALLINE couched in appearance, if it adheres in any point to its capsula, must rise again.

3. IF the posterior side of the bag be opaque, and remains, the patient must remain blind, whether the crystalline be couched or extracted.

4. IF the posterior side of the bag is adherent to the crystalline, it must be extracted, and then there is great danger of the vitreous humour coming off.

5. THE mistakes of Sennertus, Riverius, Heister, Antoine, Maître Jean, Brisseau, St. Ives, &c. about the glaucoma, are easily answered for in this new theory, founded on facts and daily experience.

IF this short account of what I have been an eye-witness to, be any way acceptable to the Royal Society, I shall soon send you some new remarks on the amaurosis and fistula lachrymalis.

I am, S I R,

Your most humble and obedient Servant,

ANDREW CANTWELL,

Professor of Pharmacy and Chemistry at the Schools of Medicine of Paris.

March 17, 1761.

Nº XXIV.

An Account of the Case of the late Rev. James Bradley, D. D. Astronomer Royal.

In a Letter to the Right Hon. George Earl of Macclesfield, President of the Royal Society, from Daniel Lysons, M. D.

MY LORD,

THE respect with which the late Dr. Bradley, Astronomer Royal, and Savilian Professor of astronomy in this university, was treated by the learned of all countries, and the esteem in which he was held by your lordship and the Society over which you preside, must naturally make the world desirous to be acquainted with the circumstances of that illness which occasioned his death, especially as his disorder was itself rather uncommon.

UNDER these circumstances, I flatter myself that I shall do what will be very agreeable to your lordship and the Society, if I lay before you and that learned body a detail of the several particulars attending the case of so very worthy and excellent a member, collected as well from the best inquiries I could make, as from the observations made by myself, who attended him in his last hours, and assisted at the opening of his body.

HE had laboured under a great oppression of spirits for a long time, and for several years before his death frequently complained of a pain in his back, sometimes attended with difficulty in the discharge of his urine, which he apprehended to proceed from the gravel.

ON Wednesday, June the 30th, 1762, he rode out for the air, and upon coming home complained of pain in his back, and made a large quantity of water. At five o'clock the
next

next morning he found himself labouring under a total suppression of urine; from which time he never voided any without the assistance of the catheter; with its assistance, however, about a quart was drawn off every twelve hours, excepting one intermission, when, upon account of the difficulty of introducing the catheter, none was drawn off from Friday morning, July the ninth, till eight o'clock on the Saturday evening; but both before and after that time the urine was regularly drawn off every morning and evening, to the time of his death on the thirteenth of July.

DURING his illness he often complained of pains in the abdomen, and his head was frequently disordered, especially when a stool was coming away; but after that had passed off, he was always more cool and reasonable. It was the opinion of Dr. Jones, who attended him constantly in the country, as well as of Dr. Lewis and myself, who visited him occasionally from Oxford, that his pains were inflammatory, though not violently so; but where the inflammation was exactly seated we could not precisely determine, as it seemed often to shift its situation, and the patient was himself incapable of giving us the necessary description, his weak state obliging him to signify his meaning more by signs than words, and those not always intelligible. As nothing positive could therefore be said with regard to the seat of the disorder, the friends of the deceased desired that his body might be opened; and Dr. Jones and myself being present at the operation, I minuted down such appearances as presented themselves to our view, and collected the following observations.

THE small intestines, the exterior coat of the stomach, and concave part of the left lobe of the liver, were all considerably inflamed: the gall-bladder was very large, and full of bile.

THE fat, inclosed in the cellular membrane surrounding the right kidney, was considerably wasted, and very much indurated,

durated, and appeared to adhere more firmly than usual to the external surface of the kidney; upon removing this kidney with its fat, all the parts adjacent appeared much inflamed: the whole kidney was soft, and contained matter so disseminated through its whole substance, that it issued out upon pressure from every part, in the same manner as an absorbed fluid does from the pores of a sponge. No stone or gravel were found in the pelvis, or any other part of the right kidney. The left kidney was nearly of the same pulpy substance with the right, equally contained matter, though not so large a quantity, and was equally free from stone and gravel.

THE vena cava and the emulgent vein of the left kidney were remarkably large.

THE aorta was ossified near its bifurcation into the crural arteries.

TWO unnatural tumours grew on the left and lower side of the pelvis internally, near the junction of the os pubis with the ischium: they were contiguous to each other, in circumference severally something less than a walnut, and both taken together were three inches or more in length. When cut through, they had the appearance of glands, and one of them contained matter disseminated through its substance, in the same manner as the kidneys.

UPON examining the bladder, the prostate gland was found enlarged and indurated, and the internal coat of the bladder itself inflamed; but neither the bladder nor the ureters contained any stone or gravel.

No morbid appearance was observed in the liver, lungs, or any other of the parts, besides those above-mentioned.

FROM the above observations it appears that the case before us was a general inflammation in most of the contents of the

the abdomen, and that the suppression of urine was probably a symptom in consequence of the swelling and induration of the prostate gland, which thereby closing the neck of the bladder, made the use of the catheter necessary. That the constitution was become extremely purulent: but as these collections of matter do not appear to have destroyed any of the vital functions, so it seems reasonable to believe that the immediate cause of his death was a general inflammation and consequential sphacelus in some of the abdominal contents.

INSTANCES of abscesses formed in the kidneys from the lodgment of calculi are not unfrequent; but then the papillæ of the kidneys being irritated and inflamed by the stone, and in consequence thereof the secretory tubes dissolved into matter, the secretion is thereby destroyed, and suppression of urine takes place in regard to that kidney.

Two cases are indeed mentioned; the one by Eustachius, the other in the *Miscellanea Curiosa*, where the kidneys in one of the subjects are said to have been found putrid, in the other semi-putrid, and no calculus in either. Such cases as these are very uncommon, and bear some resemblance to the case before us; in which it is very remarkable, that though matter was intimately distributed through every part of the kidneys, yet the tribuli forming the urinary organs of secretion remained sound, and properly qualified to perform their functions, even till death, as appeared by the urine being drawn off every twelve hours till near the time of the patient's decease, and the bladder being found distended with urine upon opening the body; whereas in the case recorded in the *Miscellanea Curiosa*, after a total suppression of urine the bladder was found small and contracted, no urine having been excreted from the kidneys into it.

THAT the matter did not in the present case insinuate into, or in any manner disturb, the urinary secretion, is evident, since no pus was ever observed in the urine, either before or
after

after the introduction of the catheter. How this extraordinary case comes to be so particularly circumstanced, seems worthy of consideration; if the singularity of it shall merit any regard from your lordship and the gentlemen of the Society, it will give the highest satisfaction to,

MY LORD,

Your Lordship's most obedient
and most humble Servant,
All Souls College,
Nov. 24, 1762. DANIEL LYONS.

Nº XXV.

An Account of the Cicuta recommended by Dr.
Storck. By W. Watfon, M. D. F. R. S.

[The Months of June, July, and August, being the most proper seasons for making the extract of Hemlock, impregnated with all its virtues; and as those who are not pretty good botanists are liable to mistake that plant, because of its great resemblance to some others, we could not omit to lay before our readers a perfect description of this celebrated vegetable, illustrated with an accurate engraving, that it may now be very easily distinguished from all those which have in their appearance any affinity with it. See plate II.—The flower in the upper part is the Hemlock-flower magnified.]

TO THE ROYAL SOCIETY.

GENTLEMEN,

IN a paper I lately laid before you, I endeavoured to demonstrate that the Cicuta major, which, since the publication of Dr. Storck's work at Vienna, had been used medicinally in England, was the plant intended by that gentleman, and not the Cicuta aquatica, as had been suggested by some

practitioners here. And Dr. Storck has removed every doubt which could remain by transmitting hither to Mr. Hudson, a very ingenious apothecary and botanist, some leaves of the *Cicuta major*, or common Hemlock, which grew at Vienna, and is of the same species with the plant so denominated here.

As Dr. Storck informs us, that since the publication of his treatise he has received letters from almost every part of Europe, confirming his good opinion of the virtues of the *Cicuta*; and as he is about to publish a second treatise * upon the same subject, containing still more extraordinary relations of cures brought about by administering that plant, there is no doubt, therefore, but endeavours will be made here to confirm the truth of the doctor's assertions; more especially as some of the diseases to which Dr. Storck found the *Cicuta* attended with great success are such as are of all others the most shocking to human nature, and have been found by too long experience to give way to no other means.

HENCE it is highly important to every one, more especially to physicians, that the very plant directed by Dr. Storck be administered, and no other in the place of it, either through inattention or want of knowledge: as judgment in the physician is of no real service, unless his prescriptions are faithfully prepared.

FOR these reasons it may not be improper to inform those medical practitioners who are not conversant in botany, and who may nevertheless be desirous of trying the effects of the *Cicuta*, that at this time of the year there is another plant growing in the same places, and often mixed with it, so much resembling it in appearance, as not without some attention to be distinguished from it; which, however, greatly differs from it in sensible qualities: great care therefore ought to be taken that the one of these should be selected from the other.

* This treatise was published some time ago.

THE plant so much resembling Hemlock is the *Cicutaria vulgaris* of the botanists, which in some parts of England is called Cow-weed, in others Wild Cicely. Its greatest resemblance to Hemlock is in the spring, before the stalks of the leaves of Hemlock are interspersed with purple spots; and therefore at that season more easily mistaken for it, though even then the leaves of the Hemlock smell much stronger, are more minutely divided, and are of a deeper green colour than those of the Cow-weed. Afterwards, indeed, they are more easily distinguished, as the *Cicutaria* flowers at the end of April and beginning of May, and the *Cicuta* not till June, when the other is past: to say nothing of the flowering stalk of the Cow-weed being much furrowed and somewhat downy, and that of the Hemlock smooth, even, and always spotted. These plants differ likewise very essentially in their seeds, which in the Cow-weed are long, smooth, and black when ripe, whereas those of the Hemlock are small, channelled, and swelling towards their middle.

BESIDES the Cow-weed there is another plant in appearance very like the Hemlock, although evidently differing from it in other respects; and, unless I am very greatly misinformed, quantities of this have been collected, and sold in London for the Hemlock: this is more likely to be taken for the Hemlock in summer or autumn, as it is an annual plant, and is produced and flowers late in the season. The plant here meant is the *Cicuta minor* of Parkinson, or *Cicutaria tenuifolia* of Ray: this, however, is easily distinguished from Hemlock by its leaves, being of the colour and shape of parsley, its flowering stalks having no purple or other spots, and not having the strong smell peculiar to Hemlock.

To the two plants before-mentioned may be added a third, which very frequently, more especially about London, grows along and is mixed with the Hemlock: this plant is called by the late excellent Mr. Ray Small Hemlock—Chervil with rough seeds, and is denominated by Casper Bauhin, in his Pi-

nax, Myrrhis sylvestris feminibus asperis. This, like the Cow-weed before-mentioned, can only be mistaken for Hemlock in the spring; it may be distinguished then from it by the leaves of the Myrrhis being more finely cut, of a paler green colour, and, though they have somewhat of the Hemlock smell, are far less strong, and have no spots. This plant flowers in April, and the seeds are ripe before the Hemlock begins to flower; and these seeds are cylindrical, rough, and terminate in an oblong point.

THE leaves of Hemlock are most fit for medicinal purposes, as being in their greatest perfection when collected in dry weather, from the middle of May to the time that their flowering stems begin to shoot, as by that time the plant will begin to have felt the effects of the warm sun, have acquired an highly virose smell, and the stems of the leaves are covered with purple spots; an argument of the exaltation of their juices: and we should be attentive here to give them all these advantages, as three degrees of latitude, and other circumstances of soil and situation, may occasion a very sensible difference in the qualities of the same plant; an instance of which occurs in the plant under consideration, and may be one of the causes why the effects of the Hemlock have not been such here, as we are assured they are at Vienna; viz. Dr. Storck says, that the root of the Hemlock, when cut into slices, pours forth a milky juice, which I have never seen it do here in England.

THERE are several vegetables, which, though they thrive apparently well, their productions are, nevertheless, not the same as in other parts of the world, where the heat is more intense, and the summers are of longer continuance. It would be extremely difficult here, though the plants thrive very well, to produce from the white poppy, or *cistus ladanifera*, either the opium or the laudanum, the known production of these vegetables in other parts of the world. No art can make here
the

the tragacantha pour forth its gum, the lentiscus its mastic, or the candleberry myrtle of North America its sebaceous concrete. To these might be added many others too tedious to mention.

IN such mild winters as the last, the leaves of the Hemlock may be procured in any part of them ; but they are not to be depended upon, as their specific smell is then comparatively weak, their juices poor and watery, and they are wholly without spots.

I am, with all possible regard,

GENTLEMEN,

Your most obedient humble Servant,

W. WATSON.

Nº XXVI.

A Remedy for the Scurvy, discovered to Jacques Cartier by the Savages of Canada.

[Extracted from the General History and Description of New France, by Father Charlevoix, a Jesuit.]

OUR author says, That towards the time Cartier proposed returning to France, all his men, not one excepted, were taken ill of the scurvy, which must have infallibly destroyed every one of them, had they not found, though somewhat too late, a remedy, which was attended with almost immediate good effects in its operation. This was a decoction of the leaves and bark of the white fir-tree pounded together. Cartier was greatly disordered himself with the scurvy, when the savages communicated to him this secret : he had already lost twenty-five men, and scarce two or three were in a condition to do business. But eight days after the use of this remedy, all his people were recovered, and in perfect health :
even

even some of them that laboured under the venereal disease, or were ill cured of it, recovered in a short time a perfect state of health. It is this tree that produces the turpentine, or the white balsam of Canada.

FATHER Charlevoix, in his catalogue of the American plants, describes it by the French name of "Epinette or Sapinette of Canada," and says it is the greatest of the four species of the fir-tree found in Canada; but its fruit or cones smaller than any of the rest, whereby it may be easily distinguished from them. He also gives a Latin description of it in these words; "*Abies Canadensis piceæ foliis brevioribus, conis parvis, biuncialibus laxis,*" which answers exactly the fifth species described in Miller's Gardener's Dictionary by the name of "the shortest pitch-leaved fir-tree with loose cones, commonly called the Newfoundland white spruce-fir."

THIS species is a native of North America, but grows naturally on the mountains and high lands, and arrives to a much greater size than the black spruce-fir, which grows naturally in swamps and bogs, and never becomes a very large tree, having its name probably from the colour of the bark, for the leaves are not of a darker colour than those of the white. The leaves of both these trees are by the inhabitants of America used indifferently for the making of spruce-beer, from whence they had the appellation of spruce-tree.

"THERE were, many years ago (says Mr. Miller) some plants of this sort growing in the gardens of the bishop of London at Fulham; in those of Mr. Reynardson at Hillendon near Uxbridge; and of Mr. Darby, gardener at Hoxton; but these have been long destroyed; so that in the gardens near London there are not any of these trees which are much above thirty years growth. Those in the elegant gardens of the late duke of Argyle at Whitton near Hounslow, are by much the finest I have seen. But there must be some trees of a greater age in Devonshire, unless they

“ they have been destroyed ; for in the year 1724 I received
 “ some branches of this tree full of cones from a gentleman
 “ of that county, who had several of the trees then growing,
 “ which were of a considerable size. These had been raised
 “ from seeds which were brought from Newfoundland, from
 “ whence there has been, of late years, a great number of
 “ the cones brought to England, some of which were called
 “ red spruce ; but the plants which have been raised from
 “ the seeds are at present so like those of the black, as not
 “ to be distinguished from them ; nor can I perceive any dif-
 “ ference in their cones ; so that it may be supposed they are
 “ the same.”

“ FROM both these species of fir exudes a fine clear tur-
 “ pentine of a strong scent, which the native Indians use to
 “ cure green wounds, and also for some internal disorders :
 “ and of late years the English physicians in North America
 “ have likewise adopted it into their practice.”

N° XXVII.

**A remarkable Case of the Efficacy of the Bark in a
 Mortification. By Mr. Richard Grindall, Surgeon
 to the London Hospital.**

THE following case being very singular has induced me
 to lay it before the Royal Society. Although nume-
 rous instances are related in the records of medicine of the
 great danger in interrupting nature in her operations, there is
 not one (so far as I know) in which more violent and extraor-
 dinary effects have been produced, than in the following :

It may happen also that this instance may be of service in
 ascertaining the virtue of the medicine in intermittents, when
 in the hands of men of judgment.

ON the 28th of June 1757, Mary Alexander, aged thirty-one years, of the parish of Whitechapel, was brought into the London Hospital, having a mortification in both hands, which reached about an inch and half above the wrists. All her toes, and about an inch of one foot beyond the last joint, were mortified; her nose was also intirely destroyed by a mortification: and all these happened at the same.

UPON inquiry into the cause of this misfortune, I found that on Monday the 30th of May she was seized with a quotidian ague, which usually began about three of the clock in the afternoon, and lasted near two hours; which was succeeded by a hot fit, and then a violent sweat: and in this manner she was afflicted for seven days without any material alteration; when, being informed by a neighbour of a person who had an infallible remedy for the cure of an ague, she applied to him. He brought her two phials, containing about an ounce and half, of a pale yellowish liquor; one of which he directed her to take directly, promising that she should have no return of the fit of consequence; and that if she had any small return, the second bottle should cure her effectually. In consequence of which she took one dose, which was at the time the cold fit had been on about a quarter of an hour; she had no sooner swallowed it, but, as she says, her stomach was on fire, and felt as if she had swallowed the strongest dram possible. The cold fit left her instantly, but she was immediately seized with so violent a fever, as to make her burn, and be extremely thirsty, all the following night; much more so than ever she had been before, till the next morning, when a sweat a little relieved her from the violent heat. When she rose in the morning, she was much troubled with a great itching in the hands, feet, and nose; and, soon after, all those parts began to feel numbed, or, as she describes it, as if her hands and feet were asleep; which she took but little notice of till the evening of that day, when she found the nails of both hands and feet were turning black, and at the same time feeling great pain in both, as also in her
nose,

nose, and that they appeared of a darkish red colour, like the skin in cold weather. Upon which, at nine of the clock that night, she sent for an apothecary, from whom, I have since been informed, the person before-mentioned had bought the medicine which he gave her: the apothecary was not at home; his journeyman went, and finding the woman had a difficulty of breathing, ordered her a mixture with sperma ceti and ammoniacum, to be taken occasionally. The apothecary did not see her himself till the 16th of June, when finding her in a very bad condition, that her hands and feet and nose were intirely black, and had many vesicles or small bladders upon them, filled with a blackish bloody water, he opened them, and let out the fluid, and dressed them with yellow basilicon; and in this manner continued treating her till the 20th of the same month, when finding no material alteration for the better, he ordered her a brownish mixture, of which she was to take four spoonfuls every four hours; which, he informed me, was a decoction of the bark; and says, on taking this she was better, as the mortification seemed inclined to stop. But as it was a bad case, he advised the woman to be carried to an hospital; and in this condition she was brought in, when she was immediately put into a course of the bark, taking a drachm of the powder every four hours, and in forty-eight hours taking it, there was a perfect separation of all the mortified parts. She was then ordered to take it only three times in twenty-four hours; and pursuing this method for eight days, there was a very good digestion from the parts above the mortification.

THE mortified part became now so offensive, that the poor woman pressed me much to take off her hands, assuring me she would go through the operations with good courage, being very desirous to live, though in this miserable condition.

ON the 12th of July I took off both her hands; I had very little more to do than saw the bones, nature having

stopped the bleeding, when she stopped the mortification. In a day or two after I took off all the toes from both feet, and now discontinued the bark, the parts appearing in a healthy and healing condition; which went on so for five weeks, when on a sudden the parts began to look livid, her stomach failed her, and she was feverish; but, upon taking an ounce of the bark, in thirty-six hours her sores began again to look well. She was not suffered to leave off the bark so soon this time, but continued taking it twice a day for a month. She is now almost well: that part of her face from whence her nose mortified was healed in seven weeks; the stumps of both arms are intirely healed; and both feet are well, only waiting for one piece of bone scaling off, which I believe will be in a very short time; and she is now in good health.

THE person who gave her this medicine is a barber and peruke-maker at Bow: I applied to him several times to inform me what he had given her. The affair was talked of so much in his neighbourhood, and the man threatened by the woman's husband, that for a long time I could not get him to tell me, till I told him I had been informed where he bought the medicines; and the time of the day that he had them corresponding with the time of his giving them to the woman, and that I knew it was tincture of myrrh, he at last told me that he had frequently given the above quantity of an ounce and half of it in an ague; that it had never done any harm; and hardly ever failed to cure. Upon which information I carried some tincture of myrrh to the woman, who tasted it, and is well assured it is the same liquor the barber gave her in her ague-fit.

Austin Friars,

RICHARD GRINDALE.

Dec. 15, 1757.

N^o XXVIII.

Observations on a very extraordinary Disorder of the Eyes.

[From the Ephemerides of the Curious.]

JOHNS Lewis Hannemannus recites the case of a woman of the burgh of Brodersdorff, by name Anne Christen, aged thirty-five, who came to consult him on a malady of the eyes, which he believes no one had hitherto observed.

THIS woman, says he, sees perfectly well in the morning till ten o'clock, and she even then reads without difficulty, as I assured myself by making her read. When it is turned of ten, it seems to her as if her eyes were covering with a cloud; the letters seem to her greater than usual, but intersected; and this darkening of her sight is preceded by convulsive motions in the integuments of the forehead. Her eyes are always dry, and she never had any defluxion from them.

AFTER the use of several remedies without any success, she found vesicatories to agree very well with her; and, so long as an humour flows, her sight has been as clear as in the natural state; but she ceases to see at the usual hour, whenever the running stops. Having ordered her a gentle opiate, she some time after acquainted me that the remedy had a good effect upon her; for as long as she continued the use of it, she could see well enough to read every hour of the day. But some cause of grief happening afterwards to depress her spirits, her sight became weak again, and blisters having procured her great relief, I counselled her to have recourse to an issue or seton, which I believe to be a very proper remedy in the various cases of the kind which often occur.

N^o XXIX.**A Woman cured of an Epilepsy by the firing of a Gun.**

A YOUNG woman about twenty years of age having met with ill treatment from her superiors, it threw her into a languishing distemper, which she concealed for some time; but the frequent fainting fits and fever which supervened, obliged those who had the care of her to seek for relief. The access of the fever continued for several days with an internal pain of the head, which generally brought on a lethargic sleepiness. However there was sometimes a week's interval between the fits, though her head was never quite free from something of this disorder. The usual remedies procured a longer interval; but after some time the fever returned, which could not be removed in less than fifteen days. They now supposed the patient to be intirely recovered; but it was so far from being true, that this only served as a prelude to a more grievous disease. In short, she was suddenly attacked with the usual symptom of an Epilepsy, namely, frothing at the mouth; however, in other things it resembled a violent hysteric fit, and at the end of it the patient raved or talked idly for some time; but there was not the least appearance of the forerunner of this last disease: the succeeding fits, which lasted eight hours, were attended with terrible convulsions and the loss of her senses; to which succeeded a sort of stupidity and a violent pain of the head with a delirium, which did not go off for some time. She had one of these fits once in three days, and by the assistance of medicines she had a cessation for three weeks: when they returned again they were full as violent, but short, and she had at least six in twenty-four hours. Then Dr. Lieutaud took her in hand, but without success, and was going to abandon her, when a young apothecary proposed the firing of a gun without the knowledge of the patient. Mr. Lieutaud left him to his liberty, in consequence

sequence of which he waited for the going off of the fit, and when she came to her senses, he stood at the feet of the bed and let off the gun. The fright threw her into a universal trembling, more extraordinary than the convulsions she had experienced before, and her mind was so troubled that she heard nothing of all that was said to comfort her. In short, the effects were so great, that they began to repent they had tried the experiment. However, in about three hours all the danger was over, for she grew calm and talked sensibly, and found such an internal change in herself, that she knew not how to express it. Besides she looked upon it as a certain sign of her recovery, as it in reality proved. The catamenia, which had been suppressed from the first attack of this disease, returned a few days after, and she continued in perfect health for above a year before this account was written.

N° XXX.

Foreign Medical Literary Intelligence.

[Being solicited by some of our friends to hasten the publication of that part of the account of Mr. Marggraf's work containing the platina, we were induced to publish it in the preceding number, p. 87. We shall now give a view of the rest of those dissertations, which, according to the order in which he has printed them, ought to have preceded those we have already given.]

THE first of these dissertations treats on the effects of solid phosphorus upon metals and semi-metals. The second exhibits some new methods of making, in a much easier manner than usual, the solid phosphorus from urine, and that in a little time, and as pure as possible, by means of a phlogiston, and of a peculiar kind of salt separated from urine.

AFTER

AFTER having successively distilled all sorts of metals with this phosphorus, and the fire urged to a very high degree, Mr. Marggraf perceived no sensible alteration, except in copper; in which, first, the metal lost its shining form; secondly, became more compact; thirdly, half a dram of phosphorus that had been put to the residuum of the distillation, had increased in weight to ten grains, and took fire when brought near to a flame. Among the same metals, tin proved to suffer the most remarkable change by this distillation; it being sublimed into very high flowers, whose form was pointed at top, and of a yellow colour inclining to red: some of them being brought to a little heap, and put under a red-hot muffle, instantly fired, and melted into a transparent glass, similar to that of borax.

MR. Marggraf extracted from phosphorus an acid spirit, the effects of which, upon some metals and minerals, he has discovered to be the following. First, this acid being poured upon very fine silver filings, the metal did not seem at all to be corroded thereby. Secondly, copper filings were much affected, the acid spirit turning green. Thirdly, it instantly dissolved the calx of copper with great impetuosity. Fourthly, iron, which was speedily and perfectly dissolved therein, shot into crystals. Fifthly, tin is not touched by this acid, except when very much concentrated. Sixthly, the effect is similar with respect to lead, only that it is more instantaneous. Seventhly, this spirit, when mixed with a calx of mercury, prepared by itself, changes colour; though this solution would not yield any precipitation with oil of tartar. Eighthly, white arsenic is entirely dissolved in it, which solution being evaporated leaves a black substance. Lastly, when poured upon zinc it is imbibed, immediately causing a disagreeable smell.

SOLID phosphorus having been treated with oil of vitriol in a strong fire, it appeared to be destroyed. Mixed with concentrated spirit of nitre, it dissolved readily therein, with a
very

very gentle sand heat; and lastly, deflagrated with great violence, it burst the retort in pieces, with a loud explosion. In concentrated acid of sea salt, it did not dissolve until urged with the greatest degree of heat. This process produced no alteration, either upon the phosphorus or the concentrated acid.

SEVERAL chymists have given different preparations of phosphorus from urine; but M. Hanchwitze was the only one who ever obtained any considerable quantity sufficient to distribute among the curious. M. Marggraf, desirous to render this preparation still less laborious and chargeable, with a view of producing it in greater quantities, and consequently reducing the expence, has made use of quite a new method. He was led to it by the verbal accounts given to him by M. Henckel, concerning the process seen in the Spicilegium, page 1004. § 14. where it is said, "That calx of lead, put in digestion with sal armoniac, salt of tartar, and old urine, then distilled, yields an arsenical smell, and at last a fine phosphorus." This assertion of M. Henckel has been confirmed by M. Marggraf's experiments, who however found this composition still too expensive, and the operation too tedious. On making various essays upon other mixtures, he at last obtained, in a short time, a fine phosphorus at a trifling charge, with fewer vessels and more safety, which was done by mixing one ounce of that fusible salt, which Boerhaave calls the native salt of urine, with one ounce of white earth reduced to a very fine powder, and two drachms of foot, yielded by a covered flambeau. Chymists will read with pleasure the account of the success of M. Marggraf's experiments in his works, and will find there a full description of the furnace he made use of in his operations. It will appear, as the author has observed at the end of the second memoir, that the phosphorous body may be regenerated when distilled again with the phosphorous acid, mixed up with fresh foot made as above.

THE third dissertation is an experimental demonstration of the dissolubility of several kinds of metals, in a solution of fixed alkali. We learn from the elements of chymistry, that acids are the common solvents of metals; but it is not generally known that even the most perfect metals, and among the imperfect ones mercury, zinc, and bismuth, may be dissolved with alkalies; this is what M. Marggraf has proved by experiments. Calx of gold was dissolved by a fixed alkali calcined with the blood of oxen, as used in the preparation of Prussian blue. The same effect happened with silver, except that the alkali dissolved a less quantity of silver than gold, whereas the volatile alkalies dissolved more silver than gold. The same effects were observed upon the precipitate of mercury; though among the volatile alkalies, none but a very well concentrated spirit of sal armoniac would act upon it perceptibly. Bismuth and zinc may likewise be dissolved in alkaline salts; bismuth more easily dissolves in the volatile, but the zinc is dissolved with equal facility in the volatile, as in the fixed alkaline salts. Most of these solutions are again reassumed, if only a larger affusion of the alkali be repeated upon the dissolved metals, which had been already precipitated by an alkali. It must be observed, that the caustic alkali prepared with quicklime, salt of tartar, alkali obtained from nitre by detonation with any kind of coals, and that alkali yielded by calcining two parts of char-coal with one part of salt of tartar, do not produce the same effect of dissolving the metalline bodies above-mentioned.

AFTER this dissertation, follows experiments shewing the manner of extracting zinc from its genuine ore, lapis calaminaris; which is succeeded by an easy method to dissolve silver and mercury in vegetable acids. It is known that gold, silver, and crude mercury, never could be affected by these acids, the strongest of which is distilled vinegar made from the best wines. There is, however, no doubt but this solution may be accomplished by attending to some circumstances, and by

means of certain preparations. These processes given by Oslander, Borrichius, Becher, Rester, and Henckel, are so troublesome or so ill contrived, that they cannot be performed without great labour, and some of them M. Marggraf has even tried without the effect; he has therefore himself sought out a new way to that purpose. The success of his operation depends chiefly on the manner of precipitating the metal. The particular preparation of his precipitate (calx) has led him to dissolve silver and mercury with great facility, not only in distilled vinegar, but even in the vegetable acids of a much milder kind, such as Rhenish wine, the juice of lemons, and sorrel. Gold has not answered his desire; but he is of opinion, that with varying the process in some circumstances, he should have effectuated the like dissolution.

M. MARGGRAF'S experiments upon the solid phosphorus, having convinced him that the fusible salt of urine, mentioned above, yields a very beautiful phosphorous substance by distillation; when mixed with a subtile inflammable body, he was induced to enquire into the nature of this salt, by its accurate analyzation.

THE sixth dissertation of this collection exhibits the result of this chymical examen. This salt, which is called likewise sal microcosmus, and the native salt of urine, must not be confounded with that which M. Haupt calls sal mirabile perlatum, it is a most fixed salt, resisting the greatest vehemence of fire; the acid cannot be separated from it, nor any of its parts, unless by the help of some other admixture. It dissolves wholly in two or three parts of very pure distilled water, making a clear transparent fluid, a little thick, resembling the appearance of a concentrated oil of vitriol. This liquor has the properties of acids.

THIS salt being dissolved in distilled water, and mixed with various metals, after a strong digestion produces the following effects: First, It does not act upon gold nor

silver; copper, tin, and lead, are but slightly corroded by it. Secondly, It dissolves iron instantly with a violent effervescence; this metal changes into a turbid substance, slimy, and inclining to a blue colour. Thirdly, Filings of zinc are intirely corroded, and changed into a white powder, which being diluted with water, and filtered, precipitates strongly with oil of tartar. Fourthly, Regulus of antimony reduced into powder, is likewise partly dissolved by this salt, when submitted to digestion. Upon bismuth it has no effect; from the mineral called cobaltum pro coeruleo, when calcined, it extracts a red colour.

SUCH are the properties of this salt when dissolved with water. In its dry state it acts more powerfully upon metallic bodies. When brought into fusion by a violent fire in a well-closed crucible, being mixed with powdered gold, it does not much alter the weight of this metal, but the scoria acquires a purple colour. Silver loses more of its substance therewith, and the scoria is yellowish, and somewhat opake. The scoria of copper is green; this metal loses less of its weight therein than silver. A part of the salt unites with this metal, and renders it whiter and more brittle. During the fusion of this salt with iron-filings, M. Marggraf observed the mixture to exhibit some very singular phenomena. It tumified like froth, and constantly emitted small sparklings and flashes, which were undoubtedly nothing but phosphorus, produced by the inflammable particles of iron, and the acid of the salt. If this matter is poured out when most in fusion, a vitreous scoria is obtained, covered on the surface with a sort of a metallic leaf; the superfluous iron remains at the bottom of the crucible half melted, half vitrified, and spongy.

THE native salt of urine, when melted in a crucible with tin, dissolves a considerable part of the metal; in other respects it changes its texture very much; the regulus becomes foliated, very shining, extremely brittle, and being broke it resembles

resembles zinc; put upon red hot coals it liquifies instantly, and then takes fire like zinc or phosphorus. It amalgamates very readily with four parts of mercury. Upon lead this salt produces nearly the same effects.

We should incur the imputation of too much prolixity, were we to shew its manner of acting upon semi-metals and other minerals, upon various metalline earths, lime, and crocuses; we therefore advise the chymists to consult M. Marggraf's works, in order to learn the phænomena which this salt produces upon being combined with acids and alcalies, contenting ourselves with only communicating the conjectures of the author concerning its formation. He says, "I am not able to determine exactly, with regard to the origin of this salt; however, I don't know if my opinion will be impugned, should I advance that this salt, and chiefly its acid part, arises from the vegetables which constitute the food and the drink of mankind. I have observed that the urine in summer time, when we eat a much larger quantity of vegetables, furnishes always a greater quantity of this salt than the urine of the winter season. I have already observed (in the second dissertation) that the seed of rocket, of cresses, of mustard, and of corn itself, when dissolved in a violent fire, will at last produce a phosphorus."

THIS discussion is followed by a memoir on the method of dissolving tin in vegetable acids, and on the arsenic which is concealed in it, with experiments which serve to confirm his doctrine. Among the several metals employed for common use, tin has generally been deemed the least noxious in its qualities; hence it is, that so many culinary utensils are made thereof, and from the same persuasion it is become customary to line the inside of iron and copper vessels with tin. It was undoubtedly believed that vegetable acids would hardly be able any way to affect this metal.

THERE are three general species of tin known and employed. First, The East-Indian or Malacca tin, which is reckoned to be the best. Secondly, The English. Thirdly, The Saxon or Bohemian. The learned M. Shultz, in his dissertation de Morte in Olla, printed at Altorf, has wrote against the use of tin vessels; but he seems to condemn only those that are made of tin that is mixed with lead or other noxious metals. M. Neuman (Prælect. Chymic. p. 1713.) strenuously denies that vegetable acids can corrode and dissolve those species of tin we have mentioned. M. Juncker (Elem. de Chym. ed. Fr. t. 3. p. 307.) admits that there may be such a solution, but he confines this effect merely to tin when calcined. The repeated experiments of M. Marggraf demonstrate, however, that tin is actually solvable in its metalline form. Vinegar, either simple or distilled, the juice of lemons, of goose-berries filtered, Rhenish wine, &c. more or less affect, according to their strength, all these three above-mentioned sorts of tin, and that without its being submitted to any degree of digestion.

If the mass of these kinds of tin contained nothing but its proper metalline particles, the use of it would be much less dangerous; but the celebrated M. Geoffroy has already observed, in his memoirs of the academy of sciences of Paris, in the year 1728, that tin, during its calcination, emits a fume, which he believes to be nothing else but arsenic. M. Henckel has proved clearly that there is arsenic in the finest tin. The experiments of M. Marggraf shew beyond all further doubt, that arsenic is a very considerable constituent in the composition of this metal. It is therefore easy to comprehend how greatly the human body must suffer in health by a continual use of tin vessels, especially if any thing of an acid, or sub-acid nature, happens to be left for a long while therein.

THE eighth dissertation given by M. Marggraf, contains a particular account of some chymical experiments, undertaken with a view of extracting a genuine sugar from several plants growing in his native country (Germany.) This expert chymist now before us, has communicated a process, by which he did extract a real sugar in pretty large quantities, and of the finest grain, from several plants, all natives of our continent. Those which have yielded the greatest quantity, are, First, *Sicla Officinarum*, white beet. Secondly, *Siferum Dodonæi*, skyrets. Thirdly, Red beet with a radish root. C. B. The sugar is chiefly contained in the roots of these herbs.

OF the chymical experiments this author has made upon the osteocolla of the marche (*osteocollum marchionis*).

WE shall only give the consequences M. Marggraf deduces from his experiments upon osteocolla, which he had of M. Gleditsch, and which is found in the countries of Sonneburg and Drossen, between the rivers Oder and Warte; being a terrestrious mixture, consisting of lime-stone, fine sand, and of putrified vegetable particles.

IN the tenth memoir we find a new method to refine silver to the highest degree, by means of common salt, or a way to reduce the calx of horn silver into its metalline form without any loss.

THE eleventh contains observations on oil expressed from ants, with some essays on the acid of these insects. This essential oil was expressed from the ant, as mentioned by Linnaeus, *Animal. Succ. sect. 85.* under the name of *formica 2*; and in Ray's *Hist.* p. 69, it is called *formica media rubra*. M. Marggraf has remarked, First, That the ordinary spirit of wine, even when rectified to the highest degree, is not able to perform the solution of it; but that this is perfectly well effectuated, if the spirit of wine be freed from its aquatic parts

parts by means of a fixed alcali, and distilled over again. Secondly, That this solution entirely dissolves the solid phosphorus. Thirdly, That the acid which is suspected to be therein, does by no means manifest itself. Fourthly, That it does not give any igneous taste upon the tongue. Fifthly, That it strikes the nose with a very peculiar smell *.

THE acid extracted by this means from ants, is very like that of vinegar, differing, however, in some of its properties.

THIS memoir is followed by another, concerning some stones, which, when stratified with char-coals, and calcined, acquire a phosphorous nature in a dark place, after being exposed first for some time to the light. The first of these stones is the Bologna stone, the preparation of which is given in the writings of Montalban, Potter, Licetus, Morfigli, Mentzel, Lemery, &c. M. Marggraf prefers the method laid down by Potter to all others, which for the most part has been adapted by Mentzel, in his dissertation on Bologna stones. He mentions several stones which had, by Valerius, been represented, but falsely, to be of a phosphorous nature, and then gives an account of those in which he has really found that quality.

THE first volume of these chymical works is concluded with an examen of the constituent parts of this sort of stones, which, being calcined with char-coal, acquire that phosphorous quality, when exposed to the light; together with a method of making an artificial composition of such stones. A more ample extract of this matter would even be too short for the satisfaction

* We remember an oil of ants, which Lazarus Rivierus places in the rank of aphrodisiac remedies; but that is not an essential oil, such as is here meant. It is only a single infusion of ants in olive oil, and exposed to the sun in the summer season for the space of forty days. Observ. xix, of M. Pacht, physician at Lunel.

of the curious in chymistry. We therefore shall finish this account with subscribing boldly to the judgment which M. Macquer has pronounced on these collections of M. Marggraf's chymical works, and we declare them, in conformity with this able judge, to be proper subjects for contributing to the improvement of true chymistry.

F R A N C E.

II. DISSERTATION sur l'Education Physique des Infans, or, a Dissertation on the Physical Education of Children. By M. Ballaxferd.

III. ALBINI de Sceleto Humano, 4to.

EVERY thing may be expected from the amazing diligence, great abilities, accuracy, and extensive knowledge of this learned professor; and we can only say that this work does not disappoint us, or diminish our good opinion of the merits of its author; but as it does not admit of extracts being made with propriety, we must refer our readers to the work itself.

IV. LE Régime de Pythagore, or, the Regimen of Pythagoras; translated from the Italian of Cocchi, in 8vo. for Gogue and Desain, jun.

V. JUST published, a new edition of the Pharmacopœia Parisiensis, 4to.

VI. Observations in Physic, extracted from the Author of les Remedes de Maladies du Corps humain, selon les Auteurs anciens & modernes, printed in 12mo, at Paris.

It would be to little purpose to be acquainted with the diseases man's body is subject to, if we were ignorant, in the mean while, of the remedies against them. It is this the author

thor discourses of in this treatise. He says, that the root of anemone, being applied to women's breasts, produces great store of milk: that the root of wild cucumber, applied to the joints, disperses and dissolves the humours which the gout has drawn to those parts: that gentian is excellent against the bitings of scorpions: that the lily of the valley is a sovereign remedy against the beating of the heart; and musk for its palpitations and swoonings: that the flesh of a crayfish reduced to powder is so cordial and alexiterial, that being taken with the root of gentian, and other the like things, it resists all sorts of poisons, particularly that communicated by the biting of a mad dog: that the brains of a hare, boiled or roasted, wonderfully strengthen the nerves: that the gall of a weasel, mingled with the juice of fennel, cures the cataracts of the eyes: that the flesh of the same creature broiled or dried, and powdered, taken to the quantity of two drachms, is a present and effectual remedy against all poisons: and, lastly, the blood of it is sovereign against the falling-sickness. *Credat Judeus Apella.*

V I E N N A.

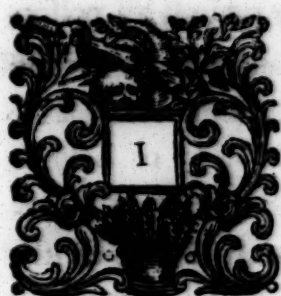
VII. Dr Haen has published a book against Haller, intitled, *Vindiciæ*, which is a defence of the difficulties proposed to the medical world (see vol. i.) Of this we shall give a translation as soon as it can be got ready for the press.

Also by the same author is just published, *Ratio Medendi, pars septima.*



THE MEDICAL MUSEUM.

N^o XXXI.



T is about two years, to the best of my remembrance, since I wrote a short piece upon the Absorbency of the Human Body, which I did not confine in private, for my sole intention was to do good to mankind in general, but particularly to those who might be driven to the fatal extremity of want of fresh water at sea, by shewing how thirst may be alleviated by immersion in the salt water, which appeared sufficient to remove that fearful exigence. To this dissertation I added a sketch of a second part (though written in haste, for I had not leisure to finish it) shewing that the doctrine there advanced had still a farther and more general scope of utility, as it naturally led us to suppose, that if the absorbent power of the body was so great as mentioned in the former part, it would not be difficult to compose baths impregnated with suitable medicinal properties; in which, if the sick were duly bathed, they might, probably, be recovered from many disorders which at present frequently defeat the more common methods of attempting their removal. But hypothesis

weighs light when reason holds the scale. I therefore produced some very strong facts to confirm the truth of this observation; shewing by cases that what I advanced was not unsupported by experience, but that I had even succeeded beyond my expectation in the cure of some desperate disorders by means of medicated baths only. Since which I have been farther convinced of the rectitude of my proposal by many strong instances of extraordinary relief obtained by baths of this sort. But were I to produce all the cases of this kind that I could, a volume would not contain them; and my time will not permit me to execute such a labour. Perhaps hereafter I may give a few of the most extraordinary instances which have occurred in my practice in this way, with a view of removing any prejudices, if prejudices there can be, against what is disinterestedly recommended for general benefit. And I shall only observe here, that such instances I have already seen and experienced of success in desperate cases, as give me the strongest expectation of conquering, by this means, many other maladies, though of the most formidable nature, where there is any promising probability of help to be gained by medical attempts. May heaven succour those endeavours which are well intended!

On Medicated Baths, as now first proposed to be used
in England. By Dr. Wilkinson.

[Continued from p. 126.]

Mortali invenias vix ullos corpore morbos

Quos aqua thermarum non medicata fuget.

Kaltenstein ad Riolan.

FROM what has been advanced in the precedent part of this short sketch on Absorbency (see Medical Museum, page 126.) it will naturally arise to the minds of those who have deliberated upon this subject so imperfectly treated, that if the human body, as is indisputable, be indued with so
great

great a power of Absorbency, perhaps it would not be any difficult matter to contrive medicinal baths, which should be impregnated with such salutiferous qualities or ingredients as might, by insinuating themselves through a watery vehicle into the body, be beneficial in mitigating, or efficacious in remedying, the miseries of that part of the human race that is afflicted with various diseases. We are encouraged to entertain the more sanguine expectations and pleasing ideas of success that may attend this external method of applying salubrious properties, by several of those facts which have already been pointed out (p. 126.): for if the ardor of a burning fever be alleviated by immersion in simple water only; if scorbutic and scrophulous disorders have been frequently cured by bathing in the sea; and if, applied the same way, natural salinofulphureous springs cure cutaneous diseases, are not these (though they may not be sufficient arguments to ascertain, yet) at least it is presumed they are, some excuse for the attempts we may make for improving these hints to a still more extended and salutiferous utility?

IT is well known that many hurtful things externally applied to the body do convey an indisposition peculiar to their own qualities. If so we find the fact to be, it is reasonable to suppose that other things of a salutary tendency will likewise convey their healing properties into the body by the same method of application.

THE great Lord Bacon, among the several hints or proposals he throws out in his sketch, called *The New Atalantis*, adds, "A number of artificial wells and fountains, made in imitation of the natural springs and baths, to be tinged with vitriol, sulphur, steel, brass, lead, nitre, and other minerals:"—again, "We have little wells for infusions of many things, wherein the waters take the virtue quicker and better than in vessels or basins; and amongst these we have water which we call water of paradise, being by that

“ we do to it made very sovereign for health and prolongation of life.”

WE are informed by travellers that the principal practice of physic, among the Mexican, Brazilian, and other American Indians, depends upon the medicinal powers which their sacerdotal physicians are able, by the infusion of salutiferous vegetables and other matters, to communicate to Baths, adapted to the different disorders and conditions of their sick. Nay, some of these writers are so very bold, as even to maintain that these unlettered and merely empirical practitioners of the healing art, by these simple methods often restore to perfect health those who labour under diseases which are deemed almost incurable even in the nations where science has diffused her rays with a more liberal effulgence.

ALSO at the back of our colonies in North America the Indians cure many disorders by hot Steam-baths, which they make by digging a pit in the earth; this they fill with water and herbs, and cover up closely with reeds and bark or leaves of trees, like a cot: into this, called a wigwam, the patient is put, and then large stones made very hot in a fire are rolled into the water, and the sick person, exposed to the hot ascending vapour, is thereby thrown into profuse sweating.

I AM likewise informed by those who have visited the western coasts of Africa, that the same method of treating diseases prevails with the same success in those countries.

FROM the remote nations of Asia and the eastern islands, where also the same manner of healing is practised, we are led to entertain the same favourable opinion of medicated Baths.

AMONGST the Jews, if we look back into ages of more distant antiquity, we shall find medicated Baths were in practice for healing the most desperate distempers. The river
Jordan

Jordan was so celebrated. The great Naaman, that he might be cured of an inveterate leprosy, was advised to bath seven times in its salino-fulphureous * or vitriolic waters, which he accordingly did, and was healed †.

THE learned Egyptians of old used medicated Baths almost upon all occasions: and Alpinus tells us in his *Medicin. Egypt.* that this rational practice, of so long standing, maintained in his time its good opinion in that nation, which could not have been the case, if the efficacy of it had not been established by certain proof and fact. Partiality to custom, though powerful, could not have continued this, if experience had not evinced its benefit.

THE Baths of Viterbo and Baia, which are impregnated with sulphureous or vitriolic particles, were a common refuge among the ancient Romans for those afflicted with various sorts of diseases: these springs would not have maintained their great reputation for healing in the most illuminated ages, if success had not established the truth of their good effects. Men were then so wise as to reason from facts. Artificial Baths of a luxurious and effeminate sort were advised by the physicians of those times to some of the great Romans: and Baths of the milk of white asses are recorded to have been in use for the renovation of juvenility, or the recovery of health, when Rome was advanced to the meridian of its grandeur and elegance ‡.

* Vide Sandys, and other travellers.

† The river Jordan runs between and communicates with the two lakes Sodom and Gomorrah, from which it derives its petrolious quality, those lakes being strongly impregnated with bitumen.

‡ Virgil, in mentioning Iapis, makes him expert

Scire potestas herbarum usumque medendi;

And in the most exquisite language informs us that this Phæbo, ante alios delectus, employed a Bath in which herbs were infused, for the cure of Æneas. Perhaps thereby intending to shew that Antonius Musa restored Augustus by this means. See Atterbury,

THE

THE ancients, according to Celsus, used Baths frequently and successfully in all fevers, except pestilential, whether of the continued or intermitting kind ; though they did not approve of them in the first stages and greatest vigour, but only in the declension of the disease : and emollient and nervous Baths have been ordered with good effect by some of the moderns to be used by old people labouring under quartan fevers, on their days of respite.

HOFFMAN says, that Baths of an emollient nature not only soften and relax the fibres when rigid, tense, and contracted with spasms, and drive the blood and humours from the head and superior parts to others that are less noble and delicate, but also wonderfully assist the circulation of the blood and juices, and promote cutaneous secretion ; for by their lubricating humidity they relax the fibres and pores of the skin, and by their warmth they expand the blood and augment the dilatation, and consequently the contraction of the heart and arteries ; hence the pulse becomes fuller and quicker, and the circulation of the juices accelerated, by which the blood being rendered more thin and fluid, is quickly conveyed to the most remote tubes of the body and to all the parts of its surface, and the elimination of the most subtle and noxiousordes is promoted : which end will be still more effectually answered, if the patient betakes himself to bed immediately after the use of the Bath, because the matter to be eliminated by the pores of the skin is restrained and pent up by the gravitation and pressure of the circumambient water so long as the patient remains in the Bath ; but this pressure and gravitation being removed when he comes out of the Bath, has his body dried, and goes to bed, so great a quantity of serum is discharged from the opened and expanded tubuli, that the whole surface of the body is sometimes covered with a plentiful, but kindly sweat.

It is scarce credible what a quantity of thick, fat, and fetid fordes is extracted from the most minute tubuli of the skin by Baths, and left swimming in the water.

BUT we have recent, I may say daily proofs of the good effects of medicated Baths more near at hand. The waters of Harrowgate in Yorkshire are strongly impregnated with a sulphur and a sort of lixivial salt *, as may be proved by mixing a certain quantity of sulphur with salt of tartar, melting them over a gentle fire until perfectly incorporated, and then dissolving the saponaceous mass in water, where you will see the sulphur suspended in a bright, beautiful golden colour; from which captivating aspect it has been sold to the unwary under the pompous name of aurum potable, and used as a choice medicine by some empirics; but in fact it seems to be

* It may not be improper here to mention, that I am informed by credible people who have resided in the eastern countries, particularly by a gentleman who was a factor at Gamron in the isle of Ormus, in the Persian gulf, and also by another who was a native of Persia, and had travelled through many of the Asiatic nations, and who had lived for some time in Arabia at Mocho, that the people in those parts are obliged, by the excessive heat of the weather at some certain seasons, to lie down to sleep on the tops of their houses, in balconies and turrets, &c. where they have carpets spread, and sleep exposed to the open air and dews, which are very excessive in those regions, and yet the natives observe, that they never receive any detriment by this exposure by night, provided there be any saltiness perceived in the taste of the dew, but rise in the morning refreshed and exhilarated; on the contrary, if the dews have not a saline taste, that then it is dangerous to sleep in the open air, and found by experience to be frequently attended with very bad consequences to the health of such people as commit this error. The saltiness of the dews in these places is, very probably, owing to the natron or aphrognitum which is found plentifully on the surface of the earth in some hot countries, and appears to be a natural, volatile, ammoniacal salt, of a very subtle and penetrating property: it is found abundantly in Egypt, Arabia, Persia, Syria, Italy, and was made use of by the ancients very copiously in their Baths; doubtless they found it had, thus employed, salutary effects. From both these considerations may we not conclude, that Baths mixed with this kind of salt would have very great effects medicinally used, as the ancients mixed it in their medical Baths, and the moderns find it salutary, when it is in these copious dews imbibed by the body?

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nothing more or less (as appears by its taste, smell, and effects) than a compound made by art of the same qualities and constitence as the water which is naturally produced from the Harrowgate spring. The virtues, I may say specific virtues, of the waters of that spring, especially in cutaneous defecations, blotches, scabs, scrophulas, leprosy, and many other foul diseases, are too numerous to be recited here, and it would not be immediately pertinent to my present purpose to mention them. If, then, we know the component parts of these waters, why should we not expect the same benefits from artificial, as from the natural Baths made of them? especially as it may be sometimes very inconvenient, or impossible, for the afflicted to be removed to the original fountain.

BATHING in warm vinegar, or fomentations with cloths wetted in it, and repeatedly applied to the surface of the body, have been ordered in the sea-scurvy by some practitioners, as they assure us, with very good success *.

MANY maladies are occasioned by a retention and redundancy of saline, acrid particles, which being detained in the vital juices, or accumulated upon the glands appointed to separate them from those juices (that they may be discharged) cause various disorders: the egress of these particles is facilitated by sea-bathing, as quantities of the solvent parts of the sea-water are thereby imbibed through the pores of the skin, and carried to immediate action upon those acrid or salt particles. It doth not seem impossible, therefore, that even a dropsy may be cured by sea-bathing: I could produce a striking instance of its efficacy in this disease, were it to my present purpose; a theory might be also advanced, to shew how this disorder may be occasioned by a concretion of saline particles forming obstructions in the urinary secretories, as founded

* See Letter from the Surgeon of the Thunderer Man of War, which was ordered by the Admiralty to be distributed among the surgeons in the royal navy.

upon experiment by careful examination and inspection of hydropical subjects; which concretions dissolving, or expelled, the cure is completed: but I shall pretermitt these disquisitions.

THEREFORE, from the practice of various nations at present, even the most unlearned, who cannot be prejudiced by the display of theory to admit of opinions or methods unwarranted by success, or unestablished by experiment, as well as from the practice of the more learned and scrutinizing part of the nations of antiquity, and, what is still more strong, from what daily passes among ourselves, both with respect to the Harrowgate Baths and the effects of sea-bathing for scorbutic disorders. From these considerations, I say, it appears evident that Baths infused with certain medical properties may be so contrived, as to answer many and very good purposes to those afflicted with several sorts of disorders

THAT great ornament of our country and admiration of every other learned nation, Lord Bacon, among his very sensible proposals mentions “ fair and large Baths of several
“ mixtures, for the cure of diseases and restoring the bodies
“ of men from arefaction, and others for the confirming of
“ them in strength, sinews, vital parts, and the very juices
“ and substance of the body *.”

SIR William Temple, in his Essay on Health and Long Life, says, “ Among the Romans there were four things much in
“ use, whereof some are so far out of practice in ours, and
“ other late ages, as to be hardly known only by their names;
“ these were Bathing, Fumigation, Friction, and Jactation:
“ the first, though not wholly disused amongst us, yet is
“ turned out of the service of health to that of pleasure, but
“ may be of excellent effect in both; it not only opens the

* New Atalantis.

“ pores, provokes sweat, and thereby allays heat, supplies
 “ the joints and sinews, unwearies and refreshes more than
 “ any thing after too great labour and exercise; but is of
 “ great effect in some acute pains, as of the stone and cholic,
 “ and disposes to sleep, when many other remedies fail. Nor
 “ is it improbable that all the good effects of any natural
 “ Baths may be imitated by the artificial, if composed with
 “ care and the skill of able naturalists or physicians *.”

STUPES or fomentations are but topical Baths, medicated with such properties as the wisdom of the person who orders them judges to be most suitably adapted to the state of the part to which they are put. These are found by experience to have in general very good effects, if judiciously managed, upon partial inflammations and local pains. The cases which solicit this kind of treatment, and in which the judicious surgeon flies to this expedient, are too numerous to be recited.

THE disgust occasioned by many, and those perhaps the most proper medicines, and the great abhorrence and loathing which most people have to physic in general, render the farther improvement of medicated Baths (which might lessen the exigence of inward medicines) a very desirable object of our acquisition. The taste and even the idea of physic are so extremely odious to some tender and delicate constitutions, that they even offend the mind, and destroy that composure of temper, which in the sick ought to be disquieted as little as possible. But even the robust are thereby deprived of their appetites, and caused to nauseate every sort of nourishment, which is indeed like planting one evil to remedy another; and nature struggles not only against her own, but the adventitious distemper, and so has two enemies to contend

* Sir W. Temple's *Essay on Health and Long Life*; Swift's edition of his *Miscellanea*, Part iii. p. 155.

with instead of one. It is very well known in chronical disorders, whilst the relish for food is uninterrupted, and the power of digestion is not much impeded, the countenance will assume no unfavourable aspect, the spirits will remain lively, and the vital functions will be exerted with energy; whilst nature has these auxiliaries to promote her generous efforts, with the external assistance of physic, it is presumed she is able to surmount many difficulties.

THE stomach and other organs of digestion have the wonderful power of assimilating all kinds of foods, whether of birds, of beasts, or of fishes; whether of animal or of vegetable substances, to one common aliment, constituting the same chyle, yielding the same sort of blood, and renewing the human body with one and the same sort of general increment, though originally drawn from such variety of different foods. Such is the transcendent chemistry of nature! Now, if the meat we eat be thus by digestion transmuted, doubtless the medicines which undergo the impression of the like operation, will also be changed in the same manner. Therefore, though they might be possessed of exalted healing qualities before, yet perhaps those qualities may be very much diminished or changed after being conveyed or converted into the chyle, and in that form carried to the blood, where they are circulated, subdivided, comminuted, and dispersed by a million of rotations through a million of the finest convoluted pipes and canals of the body. So that only a few accidental particles of the medicine, if any, will be brought to the affected part, and still fewer remain there to exert their salutiferous energy upon it. Cow-garlick (rhamsons) parsley, and some other herbs, will communicate their strong flavour to the milk of cattle who feed upon them *. It is said that some discerning

* But then it must be observed that the milk has not entered, and is not separated from the blood, therefore it may easily be supposed to retain the flavour of the matters from which it was formed.

palates are so fine as to discover if mutton has been fattened with turnips. The flesh of fowl will be changed with their food. Madder-roots change the very bones of hogs. Bishop Pontoppidan tells us that in Norway there is an herb, called *stur-grass*, or *gramen ossifragum*, which mollifies the bones of cows which feed upon it; I could produce an instance of a person who was changed to a temporary olive colour by a plentiful meal of turtle.—These great effects come from largely feeding, not from small pills or potions.

FROM these observations it will appear probable, that there may be some essential particles of the matter we eat mixed with the flesh; probably the essential oils of vegetables may be endued with a power of insinuating themselves into the blood through the nutrimental juices, and perhaps these exhilarate the spirits, and excite the blood to a more full and vigorous circulation: but this essential oil, or whatever it may be, is sent into the blood in such very small particles, as only to be just perceptible to the nicest senses; and therefore if a medicine undergoes this vast operation before it comes to the part affected, is it not amazing that ever any internal physic should be able to accomplish the cure of a disorder in the external parts? Is not this also a very cogent argument for trying Baths? for as absorbent vessels, infinite in numbers, are dispersed over the surface of the body, the essential penetrating oils of vegetables will by this means be attracted in larger abundance by the body, and, doubtless, if properly adapted, exert their good effects more fully and speedily than could be reasonably expected from a small pill or bolus, flung into the stomach.

A REMARKABLE impression of heat may be communicated occasionally to the body by means of mixing Baths of common simple water impregnated with particular ingredients, by which, under judicious regulations and cautions, probably very great advantages may be gained in attempting to remove certain disorders: this is illustrated in a singular observation made by

Dr. Maighan, who says that pure water, equally hot with some Baths, will scald much, when the heat of the Baths at the same degree can be borne; which appears, from the following experiment of Dr. Hales, to be owing to a mixture of petrolæum, viz. He found that "setting two equal glass vessels in a vessel of boiling water, both full of common water, into one of which he put some small quantity of petrolæum Barbadoense, or Barbadoes tar, with the water; then, on putting a finger into the water with this petrolæum, it had an agreeable warmth, whereas another finger put at the same time into the other glass of pure water was scalded to such a degree, that he was obliged immediately to take it out of the water;" and from hence he offers this useful hint, that bathing in a vessel of hot water, with Barbadoes tar or other petrolæum well stirred in it, might be very efficacious in many cases, since we see the body can bear much greater degrees of heat in water with petrolæum than without it.

If, therefore, so strong an impression of heat as even to approach, if not to equal, the degree of boiling water, may be given to a bath, and yet, by mixing with it some petrolæous properties, the human body is, according to this we have just now quoted, thereby enabled to sustain that violent and preternatural impression of ignited fluids, what may we not expect from such a process in many cases, where an application of that degree of heat may be safely ventured upon? If by hot water alone the most obdurate substances of animal production may be rendered soft and flexible, or even dissolved to a fluid, as is seen in the operations upon the horns, bones, and hoofs of dead animals, it is no improbable conjecture that scirrhi or knotty tumours may also be mollified, and reduced by the same means in the living, especially whilst the animal heat and that subtil, but admirable artist nature, by the impulse of the perpetual circulation and the appulse of the sanguineous moment, and other plastic powers, are then excited to co-operate with that good intention. For it is known

to every medical philosopher that nature is ever ready to succour and pour in her auxiliary influence to every propitious attempt for her relief by the most benign efforts, as might be instanced in a thousand examples, and still a million more remain to confirm this truth. Nay, there are even vegetables, we are assured by very grave authors, which if taken into the stomach, communicate such an heat, or other deossific power, to the juices of the bodies of some animals which feed upon them, as thereby to render the very bones flexil and tender. Others, as the madder, will tinge the bones of various colours, as has been already observed. It is not unlikely, but strong decoctions of such penetrating vegetables might do much service in the way of Baths, if judiciously applied on proper occasions. A benevolent man, and a good physiologist, would never be at a loss in so extensive and rich a field as is here opened to his skill, to cultivate and select productions of powers the most beneficent to his fellow-creatures, when afflicted with the direst disorders.

A VIOLENT paroxysm of the gout is often removed by the Bath of only simple water made warm. Nothing gives more instant relief in the cholic, when even in an extreme degree, than a Bath in which emollient herbs have been infused. And a dysury, suppression of urine, strangury proceeding from the stone, gravel, &c. are all amazingly and instantaneously remedied, by bathing in a warm infusion of mallows or parsley. This is the voice of truth, dictated by experience!

SOME days ago, by an accident, the servant of one of my friends was thrown down in the street under a moving cart half laden. The wheel entered upon the superior part of his left thigh, rolled up that side over the scapula, and came upon his head. Being terribly wounded, a stricture of the breast, difficulty of breathing, and violent thirst, immediately came on. Though his wounds bled, yet sixteen ounces of blood were taken away, and the bruised parts rubbed with alcohol. After which, he

was

was in this desperate condition instantly carried to the medicated Bath. He continued in it half an hour at a time, and was put to sweat in bed for three hours; and this process repeated for several times, bathing and sweating alternately. The following day, twelve ounces of blood were drawn, the pulse indicating its necessity, and the bathing still continued as the day before. After the first time of bathing, the thirst, dyspnoea, and stricture of the breast, were removed; the bruised parts, black before, resumed their natural colour. During the operation, he had plenty of broths and whey, with a glass of wine at times, to prevent fainting; and a linctus of elect. lenit. balsam. Lucatel. & syr. balsam. was given occasionally. By which treatment he was perfectly recovered in five days, though at first his life was universally despaired of.

MAY not the following well authenticated story farther confirm our doctrine?

POPE Alexander the sixth, and Cæsar Valentin Borgia, his natural son, having formed a design to destroy some cardinals who were obnoxious to them, and whose accumulated wealth they beheld with avidity, determined by poison to effect this criminal project. A magnificent entertainment was accordingly provided, to which the rich objects of their design were invited, and poisoned wine prepared for the guests, which, through a mistake of the cup-bearer, was drank by the poisoners themselves: Pope Alexander, being in an advanced age, soon expired by the force of the baleful potion; but by the help of the physicians his son Cæsar, who had drank less plentifully, by the due administration of seasonable remedies recovered; and more especially by being inclosed in the body of a mule immediately killed for that purpose, by which fomentation his skin was rendered soft, and at the same time such a copious diaphoresis promoted, that the poison was discharged, being dissipated and expelled by the orifices of the cutaneous emunctories, which were every where opened by the power

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power of this efficacious fomentation. By this means he escaped death, but not without the loss of all his hair and his skin, and was for a long time afterwards afflicted with a troublesome disorder. Consult Oldivius addit. ad Ciaconium Histor. Pontif. Rom. & Cardin. tom. iii. p. 161 & 162 *.

— LAW, Esq; of Hazlewood in the county of Derby, near Duffield, for a dropfy in his legs and thighs, which swelled greatly after a free life, sat up to the middle in a Bath of new whey from the cheese curd repeatedly for many days, and was cured; he is now living and perfectly well, without having had any relapse.

PERHAPS the following cases of desperate complaints, remedied or mitigated by this means, may contribute to remove any prejudice against establishing a just opinion of medicated Baths.

CASE I.

IN the autumn of the year 1758, I was desired to see R. H. a man who had passed his grand climacteric, and been afflicted for four years past with a rheumatism so severe, that he was confined to his bed by a total anchilosis, or privation of the use of his limbs: he lay in great pain, and hope no more strewed comfort on his pillow to disarm the thorns of despondency. I told him, I was afraid it was too late for him to receive any relief; but a persuasion that had possessed him in favour of me, made him desirous to have my opinion: I ordered therefore a Bath (though without expecting any signal relief) to be made, strongly impregnated with some very

* The reader may also consult other authorities on this subject; viz. Guicciardin, Auberius, Alana, &c. See also Marcus Aurelius, Severinus in Trimem. Chirurg. cap. de Medela ex dissectis vivis Animantibus, pag. 122. A like case is also related by Rhodius (Observ. Med. Centaur. 3d observ. 37.) of the Marquis Francesco Alvarotti, who having drank wine poisoned with corrosive sublimate, was preserved in the same manner as Cæsar Borgia. Vide Boerhaave Tract. de Potest. Medicin. pag. 273.

subtile,

subtile, attenuating vegetable qualities, and that he should bathe twice a day in this tepid liquor, remaining in it for some time. The good effects of this practice were such, that in nine days he recovered a little the use of his limbs, though at first very imperfectly, yet in a few weeks his decrepitude was inconsiderable, and he remained afterwards in a good state of health.

*Pulsa fugit macies : abiunt pallorque sitisque ;
Abjectoque cavæ suppleantur sanguine venæ ;
Membraque luxuriant Æson miratur, & olim
Ante quater denos hunc se reminiscitur annos.*

Ovid. Met. lib. vii.

It will be the more easy to conceive how Baths of warm water, medicated with proper ingredients, that are of a discutient and resolving nature, may act very powerfully upon glandular knots and tumours of a scirrhus kind, if we do not forget the great effect warm water alone has upon the hardest animal substances, which are, as we have already observed, softened and dissolved, if steeped for some time in it : even the horns and hoofs of beasts will become soft and flexible by a long digestion in this simple fluid.

It appears, by the trials I have made, upon bathing in Baths medicated with certain efficacious properties, which were ordered in many desperate disorders, that they have frequently proved successful, even where one could least have expected success, and when other methods have proved fruitless.

FROM the experiments we have made on medicated Baths in cancerous cases, we think a medicine for that deplorable malady is not to be despaired of, especially if a judicious surgeon is able at the same time to mitigate the part affected by local application, and without violent methods to eradicate

the cancerous or scirrhouſe tumours that may be already formed: then ſuch bathing is perhaps the only way to prevent their regeneration. What encourages me to have the more ſanguine expectations in favour of the efficacy of medicated Baths in cancerous caſes, is the well-known obſervation that the effects of the cancerous virus always make their firſt appearance in the glandular parts of the body, which are alſo found to be the moſt abſorbent of liquid applications. Here the malady moſt commonly begins by forming a ſcirrhouſe tumour, which in time becomes virulent, ulcerous, and a fountain of ſanies, corroſive venom.

THIS diſorder, as it is generally obſerved to be incident only to the glandular ſyſtem, and as the glands are the ſources of lymph, may be thought to be merely a diſorder of the lymph: as therefore the glandular are the moſt abſorbent parts of the human body, is it not eaſy to conceive that the application of medical Baths, which will inſtantly, and in an unchanged ſtate, convey the medicine to the depth of the very part affected, is even much more promiſing of ſucceſs and more rationally ordered in cancerous caſes, than any medicines inwardly adminiſtered, eſpecially as theſe muſt undergo very great changes, as we have ſaid above, by paſſing through the ſtomach and juices before they can come to operate upon the part immediately affected? whereas the virtue of Baths which are medicated comes immediately and with its full power to the diſordered place, before it has undergone any alteration.

CASE II.

A WOMAN, aged about fifty, afflicted with an ulcerated cancer in the breaſt, accompanied with indurated tumours under the axilla, was deemed incurable. It was propoſed to try the effects of a medicated Bath: accordingly ſhe bathed at firſt every other morning, then afterwards more frequently; but
living

living at too great a distance from the bathing-place, she did not continue the use of the Bath so long and regularly as she ought to have done; and also being low in circumstances she could not afford a bathing-tub; the Bath was therefore discontinued even at the juncture she found benefit. The effects from it were as follows: The ulcer in the breast became much more easy, the cancer was reduced at least to one half of its size, the matter from it became thickened and less fetid, and her health much restored; but since she left off the Bath, neither the cancer nor her health has been so well.

MATTHÆUS MARTINI, in Tractat. de Morbis Mesenterii, thinks Baths of sweet rain-water highly beneficial; and from the advice of Fernelius, in Observat. 44. orders their use to be persisted in for more than ten years, only that they may cure a scurvy whose symptoms are mitigated, and whose violence is begun to remit. But Valcammer, in M. N. C. decur. 2. an. 6. informs us, "That an hypochondriac and scorbutic patient was, in three days time only, perfectly cured, and recovered his strength, by using every morning and evening a Bath of sweet waters prepared with emollient herbs. The waters of the Bath were by his bathing in them rendered highly fetid, and there floated in them a thick, black, acrid fordes, which daily became more abundant in quantity."

IN order to soften and discuss hard and painful tumours of the feet and legs, there is scarcely any thing more effectual than Baths prepared of anti-scorbutic herbs, brook-lime, water-creffes, and scurvy-grass left after the expression of the juice; as also baths prepared of the tops of fir and pine-trees frequently used.

SEE also article BAIN in Bibliotheque Curieuse de la Medicine, where it is asserted that Baths of oil cure the venereal disease. But of this I am not yet certain.

CASE III.

UPON observing the good effects of a plentiful application of warm olive-oil externally to the abdomen in hydropical patients, I began to think that if the benefits of this fluid, thus topically employed, when no very large portion could be thence imbibed, were so great and so good, what greater and better effects might we not expect from immersion of the whole body of an hydropical patient in a vessel of warm oil? Accordingly, whilst I was thus reflecting, I recollected the case of a patient I then had under my care, who had been tapped twice for a dropsy, and was now almost ripe again for a repetition of that generally ineffectual operation. Determined therefore to propose an expedient which promised so persuasively, to a patient who had already obtained some relief from a plentiful unction of the abdominal region with oil, I proposed the preparation of the Oil-bath*, which was accordingly complied with. The patient's circumstances being unequal to great charge, the cheapest oil of olives was purchased, and the bathing-vessel so ordered, that a small quantity of the oil was sufficient, I think about ten gallons: had the Bath been larger, probably its success might have been more immediate; however the first bathing was followed with a copious discharge of very turbid urine, to the amount of two quarts in twenty-four hours, though he had not before discharged more than two gills in that time. And besides this good effect his spirits seemed to be recovered from a gloominess and despondency; and his sleep, which had been disturbed and interrupted, was the following night composed and tranquil; from costive his belly became soluble; and though he before had nauseated all sorts of food, his appetite was now pretty tolerable; and an intense thirst, which had afflicted him greatly and incessantly before, was now mitigated. This harvest of good effects from oil-bathing gave such vast encouragement to the patient, that he now began to bathe once every two days, and

* This was in Italy, where oil is of small cost.

was desirous to have done it every day ; but I thought it better to have a longer interval, lest the frequent use should render the Bath less effectual before the cure was performed, which was now in a fair way of being speedily accomplished ; for his discharge of urine continued ; and though it is generally said, and Hippocrates asserts it, that oil prevents sweating, yet here I found the patient to sweat very copiously always after coming from the Bath. His flesh, instead of being as one would have expected relaxed and softened by the Oil-bath, became more firm, braced, and compacted to a muscular vigour ; his hydropical aspect disappeared, and health, with good colour, reassumed their stations.

Nº XXXII.

Cautions and Admonitions respecting Baths and Bathing. By the Same.

HOFFMAN says, those waters are the most proper for Baths which in washing the soonest take stains out of linen cloths ; which in the preparation of victuals easily and thoroughly soften roots and pot-herbs ; which upon evaporation leave little or no matter behind ; and which, when poured hot upon tea or any other substances of like nature, quickly enter their pores, and easily extract their virtues. But if such cannot be had, those we can come at must be corrected and rendered soft by art, which is most conveniently and effectually done by adding to them some lixivium or soap, or by pouring into them a sufficient quantity of milk, or by mixing with them a decoction of wheaten bran, of the flowers or leaves of camomile, or of the flowers and roots of white lilies. The ancients, as we are informed by Cælius Aurelianus, added only oils, and used Baths thus prepared for alleviating pains and curing those suppressions of urine which proceed from spasmodic strictures of the sphincter muscle at the orifice of the bladder : and emollient Baths made up in
this

this manner are of singular service for facilitating delivery, especially in women with their first child, or such as are a little advanced in years, or of a dry constitution, if used in the first months of gestation. In the tabes dorsalis of children, as also the rickets, these Baths are likewise of unspeakable service; for they open the obstructed and contracted ducts, and by rendering the nutritious juices more fluid, occasion by that means a freer and more equable distribution of them to the several parts of the body, and dissipate every tendency in the juices to form congestions.

THERE are also Baths of a more gently corroborating nature made by art, which are prepared of cephalic and nervous ingredients boiled in light and pure water, and are of very singular efficacy: for Baths of this kind we principally use bay-leaves, the herb Baum, southernwood, feverfew, marjoram, wild thyme, rosemary, hyssop, clary, mint, cat-mint, pennyroyal, and flowers of camomile; all which put into a bag, with the addition of some handfuls of common salt and pot-ashes, are to be gently boiled in the water. Washing the body with medicated waters of this kind in a bathing-tub produces very happy and salutary effects in paralytic disorders, imbecillity and weakness of the joints, and proves very serviceable to feeble, cachectic, and cold constitutions, and to old men who by the violence of distempers have their strength impaired, their nerves weakened, and the tone of the ligaments of their joints in some measure destroyed: they are no less remarkably beneficial in all disorders of the uterus occasioned by abortions, difficult births, or even labours of any kind; as also in cases where the compages of the uterus is drenched with too luxuriant humidity, or where a white viscid humour discharged that way is the cause of sterility; they also wonderfully promote the obstructed menses, and the hæmorrhoids in men, when suppressed.

VAPOUR Baths are also of great utility in promoting sweat, opening the subcutaneous ducts, softening the hardened parts, relaxing

relaxing such as are tense and rigid, and dissolving viscid and tenacious humours: and that the hardest animal substances may be softened and rendered pliable, by being exposed only to the steams of warm water, is a fact known even to cooks and druggists. For this reason Vapour-baths are of singular service in cold distempers, anasarca, œdematous tumours, in cases where the limbs are become torpid and paralytic, in the lues venerea, and swelling of the testicles; they are likewise beneficial in repressing a prolapsus either of the uterus or anus, and may be prepared of different ingredients, according to the nature and genus of the distemper they are intended to relieve. In that terrible species of tenesmus which often accompanies a dysentery, the steams of milk in which elder flowers have been boiled afford instantaneous relief.

BUT as the most valuable and powerful remedies produce the most dismal and fatal effects when used unskilfully and without circumspection, so the rash and unwary use of Baths is more injurious than advantageous to the patient; for this very reason Galen lays down three rules to be observed with regard to Bathing.

I. THAT those who are subject to shivering should by no means use the Bath.

II. THAT those who have any of their viscera weak or unsound should also avoid it.—This is to be understood of the Cold Bath.

III. SUCH as have their primæ viæ clogged and incumbered with humours should cautiously avoid it.

BUT the following rules, with regard to the use of the Bath, are better and more explicit. In case then of a plethora, it is to be removed, and the belly is to be rendered lax, before the warm Bath be used, lest by the heat congestions of the blood and humours should be produced in the head

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head and breast, and those noble parts sustain an irreparable injury on that account.

IN the next place, we are to be very careful, lest by too great an heat of the Bath our bodies be so over-heated, and, as it were, boiled, as to discharge the sweat too profusely and in too large a quantity; for this incautious practice generally brings on faintings, head-ach, weariness of the whole body, torpor, and anxiety.

RIOLANUS says, " That it is necessary to evacuate the
" body, and to discharge by the help of medicines any super-
" fluities or congestions which may be lodged in the bowels
" or other parts of the body; and that when this is properly
" done, then the Bath may be safely entered, and will cer-
" tainly take away every lodgment of hurtful matter which
" would not give way to the former evacuations, by which
" they may have been however so moved, as to be the more
" easily eliminated by the help of Bathing."

AGAIN, it would be dangerous to enter the warm or cold Bath without very cautious deliberation; for many complaints which are increased by the cold, are removed by the warm, and on the contrary, many which are removed by cold Baths would be injured by warm ones.

WHENEVER a disorder, or its cause, is confined to the inward parts, so as to interfere with their functions, then the warm Bath elicits the matter towards the surface, attenuates the humours, and prepares them for an easy discharge by the pores of the skin, and thereby exonerates nature.

THE cold Bath relieves where a violent shock is required, the humours are too much dispersed, and a counteracting revulsion of the solids to promote the circulation of the blood and humours, is impeded, and the surface of the body wants bracing up to a tenser degree.

IN

IN consumptive and hectic disorders the Bath is not to be advised but with the most careful precautions: for although there are many instances of that sort for which Baths may be composed which shall have the happiest effects, yet it requires a more excellent philosophy and intuition to discern when Baths are to be recommended, than to select, suitable to such cases, ingredients for their composition.

BATHS of sweet water in three days remove costive habits, according to Riolanus, and are to be avoided in laxity of the belly.

WE should not bathe immediately after meals.

MODERATE exercise ought to precede Bathing.

IN order to dispose the pores of the body to a more speedy and plentiful imbibition of the salutary particles with which the medicated Bath is impregnated, I have always advised that the surface of the skin before immersion be well rubbed with a coarse cloth or flesh-brush, by which its minute orifices are opened to receive with the greater facility the properties we want to convey into the blood through the water, with which they are mingled for that intention.

THE body should also be rubbed all over its surface in the same manner at coming out of the Bath; again Riolanus admonishes particularly that the head should be rubbed until it be perfectly dry.

THE body should be well covered with cloths when we come out of the Bath, and immediately put to bed.

THE waters of Baths should be frequently, if possible daily changed, and fresh ingredients used.

IN the morning before breakfast, and in the evening four hours after dinner, are the proper times for Bathing.

THE morning admits of a longer continuance in the Bath than in the evening; then we should seldom exceed an hour at the longest, except in some particular cases, where it may be safely permitted.

IF after Bathing for a few days the belly seems retracted towards the spine, it is a good sign; but if it be inflated, enlarged, or affected with pains, or if it feels hot and cold by times, these are bad signals, and the Bath must be immediately discontinued.

IF after ten days the body performs its natural functions better than it did before, it is a proof that a cure will be accomplished.

THOSE that are of hot and delicate complexions, slender and attenuated, should not stay long in the warm Bath.

BUT those of stronger and more robust constitutions, who are corpulent, of a tense fibre, cold or humid of complexion, and particularly women, bear a longer continuance in the Bath.

Nº XXXIII.

Continuation of the Dissertation on the Hydrophobia.

[See p. 117.]

SECT. XVIII.

FROM the short description we have already given of the par vagum and intercostal nerves, it is evident that the tongue, œsophagus, muscles of the neck, the larynx, the bronchia, lungs, heart, ventricle, liver, reins, intestines, anus, urinary bladder, genitals, and the upper and lower extremities, as they are commonly called, are the parts to which these nerves extend

extend their communication: since therefore all these parts are affected in the Hydrophobia, as we have seen, so that they are contorted with spasms, or pierced with pain, it is clear that the explication of this disorder and its pathemata must be inquired for in those irritations of the nerves: this explication, as much as relates to the symptoms, will not be found hard to accomplish. But as there must be some cause equal to such an irritation, and capable of producing such consequential symptoms, we must first explore the cause in particular before we proceed to our general investigation.

S E C T. XIX.

SOME who have written upon the Hydrophobia have conjectured, from the rage and aversion to liquids, that the cause from whence the dreadful symptoms (which have such an effect upon the mind) do arise, must exist in the nervous fluid, which was become vitiated by a foreign ferment, or else by the influence alone of a depraved and injured imagination, upon which canine fancies and ideas were transplanted. But there are many strong objections which might be opposed to these opinions, to be met with in the histories of this disorder, which are sufficient in themselves to confute those notions, which it is not possible to support in any manner. We shall therefore pass over those fanciful explications of this disorder, which have nothing in them solid or well founded, and proceed to a more plain and easy solution, on which we may more safely rely; for it must be noted, that sometimes there are causes lurking in the most inward convolutions of the intestines, which, by irritating the nerves, excite symptoms similar to the Hydrophobia: thus, deliria arise from causes which are in the præcordia, as frequently occurs to practitioners in physic. Do not worms nestling in the intestines often occasion very surprizing effects by their stimulations? There is scarcely any disease of the head which may not, being caused sympathetically, sometimes be derived from that origin, as we are assured by experience in the epilepsy, convulsions, St. Vi-

tus's dance, and other disorders attended with alienation of mind*: the disease called angino Dei, and others, by which the præcordium is much affected, are common in malignant fevers; and in camp, petechial and some other fevers of the like kinds often perplex and confuse not a little those unwary practitioners who do not rightly consider the cause of this effect upon the fauces. It will not therefore be necessary for us to inquire after the proximate cause of the Hydrophobia, either in the head, or in the changes sustained in the animal spirits, or in any peculiar depravation of the imagination or ideas of the mind, when we find in the inward convolutions of the intestines pregnant causes perfectly sufficient to occasion and to account (by consent of parts, as it is called) for all those symptoms and effects with which the head is affected.

S E C T. XX.

IF, therefore, we consider the dissections of those bodies which have died of this disorder, they teach us the very same thing; for we find the œsophagus is ever inflamed, sometimes the ventricles and intestines either marked with points of inflammation, or gangrenous spots. In some, indeed, the liver is found to be mightily inflamed and also gangrenous on the concave face of it. In all these it is obvious that the nerves undergo a violent irritation: but when any of these phenomena may be thus derived, that one, especially during the disorder, may arise from the other, and also that each of them seem equally sufficient to excite the highest irritation to the nerves, our first question ought to be, what this first evil and idiopathic cause may be, which so extremely irritates, particu-

* A very remarkable case to this purpose is related by Scaramucchi in his Epistle to Magliabechi, E. N. C. D. xi. a. 9, 10. app. from which it appears that a pathematous Hydrophobia was caused by worms lurking in the intestines. D. J. B. Nucarinus says, that he saw himself a fever accompanied with intense thirst, watchings, delirium, spasms of the jaws, and disquieting perturbations at the sight of water, which nevertheless was cured by discharging, in vomiting, upwards of fifty worms, and other innumerable vermicular animals.

larly the nerves? When, therefore, we consider all circumstances, we hope to escape error, if we accuse first the volatile, spirituous, and acrid oily particles adherent to the blood, and then chiefly the liver; and we think it very probable that this viscus, above all others, particularly in this disorder, suffers, and chiefly is then inflamed, when the hydrophobic symptoms begin to appear; but the others, which always are discovered upon dissections, are only to be deemed effects of this cause. For,

I. THE material cause of this distemper, or the hydrophobic poison, appears to be of such a nature as to act particularly and necessarily upon the liver, because dogs run mad either in the coldest season of the winter, or in the hottest days of the summer, when by a fervent ebullition of humours in their veins, by which their motion is determined inwardly, or by an external heat, their humours are disposed to putrefaction, and the volatile acrid particles are either generated, discharged, or eliminated: from hence it is most likely that this miasma, of which they are then affected, and which they communicate to man or beast, must be of a putrid nature; and of this we are the more fully confirmed, as dogs are very apt to grow mad, if they are suffered to eat very greedily, or for a long time are fed upon putrid and cadaverous flesh. (§ V.) If, therefore, the miasma is of the nature we have shewn, it is no wonder, but rather a necessary consequence, that it must principally determine its action upon the liver, because the bile is prepared in that very viscus from oily, saponaceous, alkaline, and acrid particles of the blood; and we learn by experience that the bile is a substance of such quality as, before all others of the human body, to be inclined to putrefaction; whence the more apt to be corrupted by any kind of miasma, or to degenerate into a malignant state of itself, if once it be disposed to it.

II. IF it may be supposed that such a putrid matter exists in the liver, and may at last cause an inflammation therein, it follows

follows again (since inflammations of the liver arising from any other cause, chiefly of the vessels of the vena porta, because of a peculiar mixture of blood conveyed in these vessels *, are usually much sooner converted into the worst sanies and putrefaction) that by so eminent a cause of putrefaction this obstruction or inflammation of humours must not only produce a great acerbity and corruption of these humours, but the violent irritation arising therefrom must, by means of the par vagum, which so copiously and diffusively sends branches thither (§ XVII.) be communicated to the whole nervous system. For,

III. THE branches of this par vagum extend in so great a number to the liver (as we have said in § XVII.) that they make up the greatest part of the hepatic plexus †. Moreover, all the fibres of this plexus, surrounding the capsula Glissonis, follow so closely the progress of the hepatic vessels, which include this capsula, that undoubtedly they may convey the same into the very hepatic glands; whence, if the terminations of those branches which are derived from the vena porta are either inflamed, or only irritated by a stagnation of very depraved humours, it cannot be otherwise but the above-mentioned nerves must be constricted, and by consent, as it is called, must communicate those strictures to all other parts of the body wherever the said nerves distribute their branches. Again,

IV. THERE are some examples of Hydrophobias called spontaneous, which plainly prove the inflammation of the liver to have proceeded from the vessels of the venæ portæ, Petr. Salius informs us of a woman who was at first taken with a pestilential fever, afterwards with a dysentery, and lastly was seized with the Hydrophobia. That the liver of

* Vide III. Hambergari Comp. Physiol. § 308 & seq.

† Vide Illust. Præsid. Dissert. de Nervo intercostali, supra cit. p. 23 & seq. & Tab. adj. sub tit. P. Q. r. s.

this woman was disordered, will appear, if the case be adjudicated according to the theory of that viscus which is given by the illustrious Van Swieten in his Commentaries. Other particulars afford many pregnant arguments, shewing that the liver had been either the primary or the symptomatic cause of this sickness, and that it was chiefly of that species which arises from an obstruction of a stagnated, very acrid, putrid humour in the remotest branches of the vena porta, and in those places where the bile is mixed up. That singular symptom, the dread of water, agrees with our opinion, which may be explained partly from the continual stricture of the above-mentioned nerves, partly from inflammations either in those parts, or arising from them (as appears by dissection) in the ventricle, œsophagus, and intestines of the dead bodies. And although we have concluded the cause of those irritations, chiefly determined to be in the liver, yet we cannot intirely deny that the ventricle, the œsophagus, and especially those parts where the saliva flows, may contribute to them. For if it be certain that the bile especially is corrupted in this disorder, it must follow that the saliva will be also contaminated, as it is of the like saponaceous and spirituous nature, and, as appears from other instances, is very apt to propagate contagion, and irritate those nerves which it moistens. Yet whether a depraved saliva alone can produce the Hydrophobia and its symptoms, for the reasons we have given N^o I. and II. may be justly suspected.

SECT. XXI.

BUT besides these mentioned arguments, taken as well from the infectious nature of the Hydrophobia, as from the situation of the place upon which it exerts its virulency with respect to the blood and nerves, there are other reasons which from analogy render it very probable that the liver is primarily affected by this malady.

I. EXPE-

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I. EXPERIENCE proves by a very singular and remarkable phenomenon, that the poison communicated by the bite of mad animals acts chiefly upon the liver and the bile; for it is well known that the jaundice most commonly follows the venom of vipers; wherefore, by some authors, the poison of venomous animals is reckoned among the causes of the jaundice. But there are other animals, as we have many instances, whose bite, like that of vipers, frequently causes the jaundice. Langoni * has observed, that a man who was bitten in the right hand by a house cat, was seized with great pains and swelling of the hand, which going off, was succeeded by a jaundice of forty days continuance. The like example of a pertinacious jaundice he gives of a man who was bitten in the leg by a dog. There are more examples related by Marc. Donajus †, Paulini ‡, and others, of the jaundice occasioned by poisonous bites, also from drinking of poison: one is mentioned of a girl who contracted a jaundice from the bite of a squirrel exasperated by her play with it. From these observations even the illustrious Van Swieten in his Commentaries (chapter on the liver) has supposed it to be probable, that the bite of venomous animals disorders particularly the functions of the liver, as other poisons, such as hyoscyamus, &c. disturb the brain, or cantharides the reins.

II. THE Hydrophobia, when considered in its whole extent, besides the convulsive pathemata and their effects, is found thro' all its stages to cause symptoms perfectly similar to those of acute and malignant fevers: for in these fevers not only great oppressions are perceived in the breast, which frequently are relieved by evacuating the corrupted bile by the assistance of proper vomits; but likewise dissections have always shewn, to the constant observations of Lancisus, Bianchi, Brendel, and

* Aët. Nat. Cur. tom. i. obs. 29.

† Lib. I. Hist. Med. Mirab. c. 9.

‡ Ephem. Nat. Cur. dec. ii. an. 9. obs. 188.

other great men, that the liver, particularly on its concave side, has been deeply affected, as appeared by livid streaks and several intermingled spots upon it: the convex part, except being a little redder than natural, was perfectly sound; although the bile was to appearance totally corrupt.

III. IN the dissections of those who have died of the quinsy, where no inflammation nor gangrene in the fauces or other parts appeared, yet the liver has been found intirely in a state of putrefaction, and, as it were, in a dissolving condition; of which Bonetus * gives an example of a man who, in the space of thirty hours, died of a quinsy; for the illustration of which he brings several instances from the like disorders in the brute creation, in which the liver had been found equally putrefied, though the distemper had seemed chiefly to be in the throat. By the like observations, on which we may safely depend, we find that in anginary disorders we must not always conclude the inflammation to be situated in the neck, as we have already observed (§ XIX.) but that the causes of the distemper may be resident in the lower and internal parts of the body, frequently in the liver: which argument is of the more weight in the Hydrophobia, as it is certain that even when the dread of water has taken place, and the deglutition is obstructed, yet the fever is milder than in the angina; and frequently on dissection scarce any traces of inflammation have been found in the fauces, as is seen in the celebrated authors above-mentioned, to whom the excellent Mead may be added. Nay, we have heard of an Hydrophobia of such a species as was quite contrary to an inflammation in the throat, which is that chronical Hydrophobia not derived from the bite of animals †, and which has continued for the space of several months; whereas a real inflammation of the fauces, being an

* Anat. Pract. tom. ii. sect. 1. in additam.

† Act. Nat. Cur. vol. vi. observ. 97. a. D. D. Wolfius notata, & sect. 1. nostr. dissert. citat.

acute distemper, does not admit so long an interval, but speedily terminates.

IV. FINALLY, All these arguments gain an additional weight from those many symptoms which attend an inflammation of the liver, as they are either common to the Hydrophobia, or affect the neck, although the disorder lies deeper. To be short, let us hear what Lommius says very expressly *; A burning thirst parches the liver, attended with an aversion and nauseating of food; the tongue becomes furry, charged at first with a yellow scurf, which afterwards turns black, with pains extending to the throat, and even to the shoulder on that side; sometimes the right hand will be contorted with spasms, and the patient almost strangled with the singultus, and other such symptoms. By all which we think ourselves sufficiently excused, and even confirmed, in having sought for the causes of the Hydrophobia in the inferior regions of the body, and in having accused the spirituous, volatile, and acrid parts, which do not only exert their effect upon the liver, but corrupt also the fluids which exist, or are secreted in that viscus, as well as those other parts which have any connexion therewith.

S E C T. XXII.

HAVING now explained the most proximate causes of the disorder, something should be added concerning the manner of acting, by which they produce their effects, which, however, is not so easy a matter, as our subject concerns the most minute and subtile phenomena. However, something may be comprehended, and that not inconsistent with verisimilitude, if only a proper attention be paid to the nature of the poison, as well as to the condition of the parts of the human body which it particularly invades. We have said above (§ XX.) that the volatile, spirituous, and oleo-acrid particles

* Loc. cit. p. 186 & seq.

are principal constituents in the hydrophobic venom; from the nature of which it therefore immediately follows, that those things, especially in the human body, which bear any analogy or affinity to such qualities, may thereby be changed and altered. For it is manifest that not only the fluid of the nerves participates of a certain salino-fulphureous property, but that likewise the medulla of the brain and the pulp of the nerves, physically examined *, approach to the same quality. Hence it may be seen, why this poison primarily exerts its virulence as well upon the nervous fluid as upon their solid parts, and violently irritates and injures the nerves: it is furthermore evident from its analysis, that the bile receives into its composition many spirituo-saline and oleo-acrid particles, wherefore this poison exerts its violence principally upon the bile; which may happen the more easily, and as it were in a two-fold manner, since, as is evident from physiological, but especially from pathological phænomena, that the nerves have a considerable command over the bile. The same, but in a less degree, may be asserted with regard to the saliva, and other juices of that sort, which receive a copious flow of spirit (§ XX.) Whoever therefore considers these things, will readily grant that the principal effects of the hydrophobic venom which we have mentioned, must be exerted not only upon the liver and its nerves, but upon the nerves in general. But why this venom is sometimes slower, sometimes quicker, in different constitutions, and in some begins to rage in fourteen, in some in forty days, and in others even lurks for a longer space, has never yet been explained, nor will any body either expect or require it from us, since no arguments à priori can possibly be advanced. One thing, however, may be easily understood, which is, the larger the quantity of poison inserted, it is the quicker, and on the contrary, the less in quantity the slower it will be in effect, as many of the above-mentioned examples sufficiently evince.

* See Hamberger Physiol. Med. § 347 & seq.

SECT. XXIII.

THE above being duly premised, we may now proceed to explain the particular reason of the symptoms.

I. IT is to be observed, that some degree of pain is perceivable in the part where the bite is infixed, but more especially in the immediate place where the cicatrix is formed: this may not seem a phenomenon so peculiar to the Hydrophobia as to deserve to be referred to the characteristical symptoms of this disorder, the same thing commonly happening in others: for if we examine into what occurs very frequently to the cicatrices of wounds, we shall find them to be attended with similar pains before any remarkable change of weather, or whenever any disorder is at hand. In both which cases the consequent debility of the wounded part always relents, and is affected as the part is the less able to resist all external force, and is the more easily injured: the like also happens, as is plain, in the Hydrophobia, and perhaps in a somewhat greater degree from the greater force of the efficient cause.

II. BESIDES this particular pain in the cicatrix of the wound at the beginning of the disorder, a more general one, but fugacious and aching, like a rheumatic pain, affects the neck, head, arms, and back-bone; the explication of which will not be very difficult to any one who recollects what we have briefly said (§ XVI. and XVII.) of the progress and connection of the par vagum, and especially the intercostal nerves forming the hepatic plexus, with the rest of the cervical ones; and that the principal seats of pain are the places where ganglia are formed by these nerves, by the intermediation of which, all the parts to which branches are from thence detached must inevitably be affected with pains and spasms, as soon as ever the primary trunks are injured. Indeed, we frequently see the like pains to happen, if the

branches of these nerves, detached into the first passages, are irritated by any offending cause or exasperating acrimony, as is the case in intermittent fevers, from indigestions, bilious cacochymy, or other acrid humours, or from clots of nestling vermin, which being expelled, those effects immediately cease.

S E C T. XXIV.

FROM the same irritation of the intercostal nerves we may easily trace, III. the cause of that singular tightness of the precordia, with its effects, which is the first symptom of this disorder, and with which, through its whole progress, the patients are oppressed. When the morbid matter is first brought to the liver, stagnating there, its sharpness is increased, either from a corrupt bilious blood, or the bile already prepared irritates the nerves (§ XXII.) it must thence unavoidably follow, that by that stimulation the stricture will be conveyed to the nerves of the ventricle (§ XVII.) communicating with the hepatic plexus (§ XVI.) and will from thence be propagated to the pulmonary plexus, arising from the same trunk with those of the stomach. (§ XVII.) The ventricle, heart, and præcordia being thus oppressed, and the lungs in the same state, great anxiety comes on, by which the free circulation of blood, and perhaps of the air also confined in the contracted pipes of the lungs, may be obstructed. The cause of this tightness and anxiety will appear to be still further increased, if the whole intercostal nerve, irritated by consent from the liver, may also be supposed to transfer the stricture to the intercostal muscles of the breast, and even to the diaphragm. And if also in its descent the same be not only conveyed to all the dorsal nerves, but likewise to the diaphragmatic or phrenic, which communicates between the intercostal nerve, the semi-lunar ganglia, and the abdominal plexus; or if, as our illustrious Schmidel has sometimes supposed, one horn or point of this ganglion is formed by the concurrence of the phrenic nerve; from hence, I say, it will appear that the obstructed respiration, want of breath, sighing, and the other concomitant symptoms, may be investigated and derived.

SECT. XXV.

FROM this view of the effects of irritation upon the intercostal nerve we may take a farther prospect, why in the incipient Hydrophobia the patients are so troubled with terrors interrupting their sleep; why they are sad, tremulous, drowsy, and languid; their eyes sorrowful and flowing with tears; their countenances grim with a dismal ruddiness; and why they have sometimes a tingling in their ears and sometimes a total loss of hearing (§ II. N^o III. IV. V.) which partly comes from the disturbance of the respiratory organs, and partly from the connexion of this nerve, which communicates from the eyes to the ears. For in the first place, the constriction of the respiratory organs hinders the free circulation through the lungs, by which the blood is accumulated into the head, from which follows a too great distension of the vessels superinducing the aforesaid consequences. Then the roots of the intercostal nerve arising from the par vagum, and more particularly the concurrence of the branches from the fifth ophthalmic pair, demonstrated by these as well as many other phænomena, sufficiently contribute to facilitate our investigation not only of the change of the aspect of the face and eyes, but especially the greater afflux of tears, if we consider the distribution of the ophthalmic nerves in their orbits. Finally, the cause of the dullness and tingling of the ears will be easily understood by those acquainted with the furculi or twigs which the radix intercostalis, coming from the upper maxillary, sends off to the ears, as is fully illustrated by our President Schmidel, in his Dissertation upon the intercostal Nerve, § iii. p. 6, 7. also § xix. p. 33. All which symptoms may seem the more certainly to be derived from these concurring causes, as the like symptoms are frequently observable in other disorders which are attended with a congestion and accumulation of blood into the head.

[To be concluded in our next.]

N^o XXXIV.

The Method of making Sal Ammoniac in Egypt, as communicated by Dr. Linnæus, from his pupil Dr. Hasselquist, who had been lately in those Parts. By John Ellis, Esq; F. R. S.

SAL Ammoniac is made from the soot arising from the burnt dung of four-footed animals that feed only on vegetables.

THIS dung is collected in the four first months of the year, when all their cattle, such as oxen, cows, buffaloes, camels, sheep, goats, horses, and asses, feed on fresh spring grass, which in Egypt is a kind of trefoil or clover; for when they are obliged to feed their cattle on hay, and their camels on bruised date-kernels, their excrements are not fit for this purpose: but when they feed on grass, the poor people of Egypt are very careful to collect the dung quite fresh, and for that purpose follow the cattle all day long, in order to collect it as it falls from them; and if it is too moist, they mix it with chaff, stubble, short straw, or dust, and make it up in the form of cakes about the same size and shape as it lies on the ground.

THEN they fix it to a wall to dry, till it is fit to be burnt.

FOR want of wood, which none but the rich in Egypt can afford to buy, they burn this dung through the whole country, and sell a vast quantity of it to the salt-makers.

THE excrements of the camel are not found at all preferable to another; and its urine is never used for this purpose, although generally reported so by authors. The salt-workers pretend that the human excrements, and those of goats and sheep, are preferable to any other.

THE

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THE months of March and April are the only time they make the falt.

SAL ammoniac is made in the following manner: They build an oblong oven, about as long again as broad, of brick and moist dung, of such a size, that the outside or flat part of the top of the arch may hold fifty glafs vessels, ten in length and five in breadth, each vessel having a cavity left for it in the brick-work of the arch. See plate III.

THESE glafs vessels are globular, with a neck an inch long and two inches wide.

THESE vessels are of different sizes in different falt-works, containing from a gallon to two gallons; but in general are about eighteen inches diameter.

THEY coat each vessel over with fine clay (which they find in the Nile) and afterwards with straw; they then fill them two thirds full of foot, and put them into their holes on the top of the oven.

THEY make the fire gentle at first, and use the forementioned dried dung; they increase the heat gradually till they bring it to the highest degree, which the workmen call hell-fire, and continue it so for three days and three nights together.

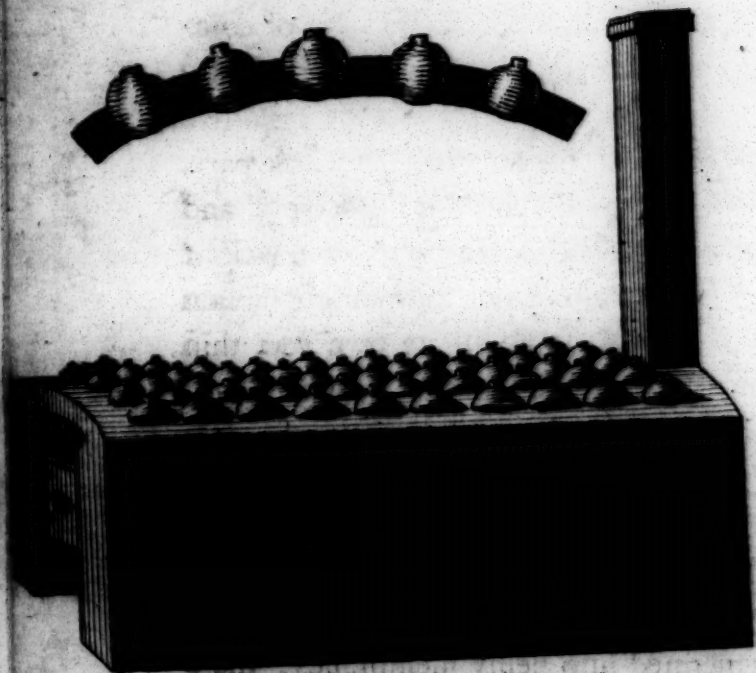
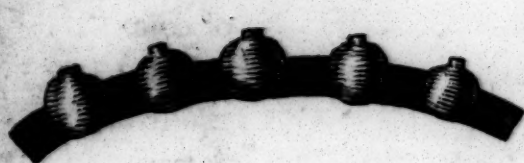
WHEN the heat is come to its due degree, the smoke shews itself, with a sourish smell that is not unpleasant, and in a little time the falt sticks to the glasses, and covers the whole opening: the falt continues subliming till the above-mentioned time is expired; then they break the glasses, and take out the falt, just in the same form and of the same substance that it is sent all over Europe.

AT each falt-work they have a glafs furnace, to melt the old glasses and make new ones.

N^o XXXV.



Fig. 1.



*A Plan of the Subliming Furnace or Oven for making
Sal Ammoniac in Egypt.*

N^o XXXV.An Account of a Bone found in the Pelvis of a Man
at Bruffels. By Terence Brady, M. D.

In a Letter to the Rev^d. Thomas Birch, D. D. Secretary to
the Royal Society.

REVEREND SIR,

I SEND you here inclosed a draught of a bone found in the pelvis or bason of a man that died in the military hospital of this town the twelfth of March 1760, of a seven day inflammatory distemper. This extraordinary concretion, weight about twenty ounces, has all the external appearances of a bone, with the hardness, solidity, and specific gravity of common stone: it is chequered or marbled as you see in the figure (Plate III. fig. 2.) by which you can distinguish the primitive particles of the bone whiter and harder than the dark part. It was found on the lower extremity of the mesocolon, and probably, as it grew big, was carried down by its own weight into the bason, where it had no adherence to, nor connexion with, any of the adjacent parts, but lay in its own very thin membrane or periosteum, betwixt the os pubis and the bladder, somewhat to the right side. It was joined to the mesenterium by a tough, compact, membranaceous, glandulous substance, in the form of an inverted cone, whose point was firmly inserted in the cavity observed on the top; here the membranaceous fibres were turned into bones, or, vice versa, the fibres of bones degenerated into fleshy membranes; there was no intermediate cartilaginous substance to be observed. By drawing up this conic body with very little effort the bone followed, to the great surprize of all the spectators; after which there was no farther inquiry made in regard of the other viscera of the abdomen: it was only taken notice of that the omentum was quite consumed, and the mesenterium very much swelled and scirrhus.

THE man that bred this monstrous Bone was called Strafzet, was born in Bavaria, and lived to the age of fifty-five, of which he was twenty-eight years a musqueteer in Bareith's imperial regiment: he was always strong and healthy till about five years ago, when he began to complain of the hardness of his belly, and now-and-then of a suppression of urine; of which last inconveniency he could help himself by turning on his right side, and lying a little on his face; by that position the stone did no more press on his bladder. He never missed doing foldier's duty till his last sickness, about seven days before his death.

WE have examples of membranes, and of several soft parts of the body, being ossified; but I believe there is not such a monstrous production as this to be seen any-where.

ABOUT twenty years ago I saw at Mantua two inches of the aorta, near the heart, turned to Bone in a man that was a long time tormented with a violent palpitation of heart.

I KNOW, Sir, relations of such extraordinary appearances are often, and with reason, suspected of exaggeration, but you may depend upon the veracity of this. I am,

Reverend SIR,

Your most humble

and most obedient Servant,

TERENCE BRADY, M. D.

[The length of the bony substance was four inches and a half, and its perimeter in the largest part eight inches and a half.]

N^o XXXVI.

Observations on Dr. Hunter's Medical Commentaries.

By J. Garner, M. D.

[See p. 159.]

THE blow Dr. Hunter has struck in this production will, I apprehend, necessitate his antagonist to desist from the combat, and sheath his sword in peace; for he has demonstrated, by the credible testimonies of many gentlemen who attended his lectures, that he was prior to him in the injection of the internal tubes of the testicle; in conceiving, and supporting by satisfactory proofs, the opinion of absorption by lymphatics; and in discovering the ducts of the lachrymal gland; not to mention the high probability that Dr. Monro's first idea of these improvements which he has published as his own, flowed to him from Dr. Hunter, through some of the channels he has specified. To the accumulative, convincing proofs adduced by this author of his having inculcated and confirmed by solid arguments the doctrine of lymphatics being a system of absorbing vessels, before the time Dr. Monro pretends the discovery dawned upon himself, I will add as a corroborating evidence, and an undeniable confutation of some passages in his antagonist's pamphlet, what Dr. Cullen, when professor of medicine at Glasgow, advanced in a lecture delivered Jan. 11, 1754, and taken down in shorthand: "The common supposition with respect to the lymphatics is, that they are reducing vessels, contiguous to, and rising from, the arteries, like the veins. Mr. Hunter is the FIRST that says the lymphatics rise as absorbent vessels: he cannot fill them, as the other veins of the body, by injecting the arterial system. Mr. Hunter says that no injection can reach these without a rupture; but, by wounding the parts, the lymphatics will be filled with the injected matter: he can likewise inflate them with air, by blowing

“into the substance of the glands with a blow-pipe. From
 “this he thinks they rise from cavities as absorbent vessels,
 “and, as they terminate in the thoracic duct, carrying a fluid
 “similar to that, deposited in the interstices. A watery, se-
 “rous fluid constitutes a great part of our blood, and is
 “poured out into all the cavities; and the lymphatics, it is
 “probable, are fitted to absorb this, as the lacteals are
 “adapted to imbibe one kind of fluid chiefly from the in-
 “testines,”

IN the 33d page Dr. Hunter answers the accusation his op-
 ponent has brought against him, of having described certain
 ducts rising from the epididymis, without mentioning him,
 the supposed author of the discovery, by flatly denying that
 he ever either publicly demonstrated or saw any such vessels,
 asserting he always was, and is, inclined to believe that no
 such vessels exist, and that Dr. Monro had taken a common
 lymphatic of the part for some remarkable tube that had hi-
 therto escaped the eye of anatomists. But has not the inge-
 nious, experienced anatomist Haller * confidently affirmed that
 there are such ducts?

OUR author in the fifth section attacks his antagonist upon
 the subject of absorption by sanguiferous veins, premising his
 opinion with respect to the manner in which the fluid found
 in all the cavities of the body is deposited there; which is,
 that it is not poured out by the minute branches of arteries,
 as is commonly supposed, but transudes through the coats of
 the vessels: in proof of this hypothesis, he has advanced sever-
 al reasons, which to me appear by no means conclusive.

He first observes, that the arguments for the exhalation of
 arterious branches into the cavities, taken from the injections

* Prim. Lin. Physiolog. § 790. This he has likewise asserted in explicit
 terms in his Element. Physiolog. lib. ii. sect. 3. p. 166. and lib. vii. sect. 3.
 §. 17.

of the latest and best anatomists, only shew that a thin fluid readily passes out of the arterial system into the interstices, and consequently no more demonstrate that the arteries open into the cavities, than they prove transfusion. I shall, however, remark that the most skilful hands have, in late attempts, not only thrown glew and oil, which, in my opinion, would not easily ooze through the texture of the canals, but even mercury, into the different interstices of the body. In proof of this I could cite many passages from Haller *: nay, that anatomist has injected wax itself from the arteries into the cavities †. Had a rupture happened in making these injections, it would not, I apprehend, have escaped the discerning eye of a Haller. He has seen, he positively declares, the injected wax sticking in the very extremities of the villi ‡; so has that matchless son of the injecting art Ruysch ||, and the illustrious Albinus **. These experiments, not to add that Cowper and Vieussens have pushed mercury, Peyerus and Kaau †† wax, out of the arteries into the several interstices; the experiments just mentioned, I say, appear to me unanswerable arguments for arterial exhalation, and prove, to the intire confutation of our author's assertion, that it is not subtil fluids only have been thrown out of the arteries into the cavities by the most expert and by modern anatomists.

* Prim. Lin. Physiol. § 710. The passage of quicksilver into the cavities is also affirmed in § 44. and Elem. Physiol. lib. i. sect. 4. p. 37. lib. iv. sect. 3. p. 324. and lib. vii. sect. 2.

† Elem. Physiol. lib. ii. p. 105. Consult lib. ii. sect. 1. p. 108. and Prim. Lin. Physiol. § 272 and 44, where he says wax is impelled with ease out of the pulmonary artery into the vesicles of the lungs.

‡ Elem. Physiol. lib. ii. p. 106.

|| Epist. XI. Th. max. n. 33. Th. ii. n. 14. See also Th. iv. n. 96. Th. max. n. 112. Th. x. n. 35. Mus. rar. p. 134, 135.

** N. 112, 186, 187.

†† N. 186, 196, 201, 213, 798,

DR. Hunter's next argument for transfusion, drawn from his having observed, in throwing fluids coloured with the powder of vermilion into the arteries, that none of the vermilion ever passed into the cavities without a rupture, has not, perhaps, much force: for is it unreasonable to suppose that the vermilion would be denied a passage through the extreme narrow orifices of the arterious branches, when the fluid would find a way? Dr. Haller's expression shews it is not; "*Solum enim, in exemplo, oleum terebinthinæ exsudat dum minium in minimis vasculis residet, utique secuturum, si vascula rupta essent* *."

THE circumstance of the cellular membrane's not being immediately filled in injecting the arteries, but becoming by degrees more loaded, as the arteries emptied, urged by our author, pleads, in my opinion, equally strong in behalf of the supposition of exhaling branches of arteries, which, as extremely fine, must, it is reasonable to believe, gradually deposit their contents.

BUT, adds Dr. Hunter, water and red blood transfuse through all our vessels, and membranes in dead bodies: this I must beg leave to dispute. Certain it is, clear water's becoming tinged with blood by our steeping in it the apex of a well-washed heart, or the convolution of a piece of fresh intestine, which he has mentioned as a proof of it, is far from demonstrating it: for the blood may be communicated to the water by the orifices of the arterious ramifications; and we all know the maceration of a part of the body in water relaxes it to a very high degree, and destroys the natural texture.

NOR can I allow any weight to his assertion, "No man can have opened any number of bodies without granting that the gall does pass, in living bodies, through all the coats of the gall-bladder, and pervades the substance of the

* Elem. Physiol. lib. ii. p. 104.

“ neighbouring parts, not by exhaling nor by inhaling vessels, “ but by manifest transfusion or soaking.” For what? if in the bodies opened the parts have been diseased. What? if they are, which frequently happens to many parts of the human structure after death, in some degree ruptured. And I must not omit adding, that the bile is undeniably a fluid of a peculiarly acrid nature, and becoming more putrid and acrimonious after death may, by corrosion, procure itself a passage through the gall-bladder: this will be rendered very plausible by my observing, that in the scurvy, in which a high putrescency and acrimony of the blood prevail, the vessels and other parts are actually eroded, as appears indisputable from the state of the gums in that disease.

BUT were we to admit that water, red blood, and bile, do transude through the vessels in dead bodies, could it with any certainty be gathered from this, that the interstitial fluid oozes through the coats of the canals in life? The compact firmness and tension of the vessels in the living body will, in my opinion, resist and prevent the supposed transfusion.

DR. Hunter has asserted, red blood does not transude through the vessels of the living body: but in the species of malignant fever, distinguished by the appearance of livid or red spots, it is certainly deposited in the cellular membrane, when there is not the least reason for suspecting that a rupture of the vessels has happened. And Dr. Haller has given as a description of the case of a gentleman who laboured under a fatal obstruction of the lungs, the vesicles of which, upon opening of the body, were found replete with red blood, no inflammation appearing, and the viscus being perfectly sound *. The skilful practitioner Huxham avers, bloody stools, hæmoptoes, and other hæmorrhages, sometimes occur without

* Opusc. Patholog. observ. xiv. hist. 1. The effusion of arterial blood into the cellular membrane of the live body, the vessels unhurt, he has confirmed in Elem. Physiol. lib. i. sect. 4. p. 37. 38.

the least pain, purulence, or any symptom indicating that the vessels are broke *. I myself have known a spitting of blood happen without any perceptible disorder of the system, which, it is probable, would not have been the case had the ramifications of the pulmonary artery been wounded. Now, if agreeable to Dr. Hunter's opinion, which the consideration of the firm texture of the canals, and the nature of the crimson stream flowing through them, induces me to embrace, red blood does not transude through the vessels in life; if it sometimes be, as the instances adduced seem to demonstrate, deposited in the cavities of the living body without a rupture, it is an undeniably just conclusion that it must be poured out into them by the exhaling branches of arteries; the resistance it meets with, or its increased velocity, very probably forcing it through their dilating orifices: nay, that arterial ramifications do, in fact, pour out blood itself into the corpora cavernosa of the penis, and periodically into the cavity of the uterus, is undeniably certain.

AND as they open into those parts, so it is universally acknowledged, they do likewise upon the surface of the body, and exhale a thin fluid. Why not then into all the cavities? Does not the voice of analogy plead for this?

WHAT has now been advanced corroborates, I suppose, not a little the opinion of the interstitial fluid's being deposited by exhaling branches of arteries, and demonstrates the invalidity of the arguments Dr. Hunter has suggested in proof of transudation; a tenet maintained before by Glisson, nay long ago by great Galen †.

HAVING proposed his notion of the channel through which the fluid found in all the cavities of the body is conveyed into

* On Fevers, p. 44. 191.

† De Tumor. præter Naturam, cap. ii. Charter. tom. vii. p. 315.

them,

them, Dr. Hunter gives it as his opinion, that the branches of red veins absorb no part of it. To prove this, he has adduced a number of experiments made by his brother; and he attempts to confute the arguments produced by Professor Monro junior, in support of absorption by sanguiferous veins. Dr. Monro has observed, as the remark of Dr. Haller, that fluids injected from the trunks into the branches of the veins sweat out upon the surface of the body and into its different cavities. Our author alledges, Dr. Haller has not advanced this in the place the professor has referred to, and has declared the assertion false: that celebrated anatomist has, however, explicitly affirmed it *.

THAT sanguineous veins are absorbents, not to urge that Malpighi has pressed drops of fat into the vena porta out of the cellular membrane connected with it; that red veins, I say, do absorb, is farther demonstrated by the experiments of Drake †, by the experiments of Vieussens ‡, who has forced water, and even mercury, out of the veins into the cavities; by the experiments of that ingenious pupil of nature, who has traced with great assiduity her operations both in the vegetable and animal creation, Hales, who has thus expressed himself: "When I fixed the above-mentioned tube to the vena porta of another dog, so as to make the water pass through it to the guts, having then slit open a part of a gut, as before described, I found the water oozed

* Elem. Physiol. lib. vii. sect. 3. § 17. In many other passages in the same work he asserts, in terms most express, that water and glew injected into the venal trunks exude into the various cavities. Consult lib. ii. sect. 2. p. 153. lib. i. sect. 4. p. 40, 41. lib. viii. sect. 2. § 22. lib. iv. sect. 1. p. 28. lib. viii. sect. 5. § 20. and sect. 2. § 2. lib. ii. p. 104. — That oil and gelly and water, thrown into the large veins, issue from all parts of the body, he has affirmed in Prim. Lin. Physiol. § 48. 444. 21. In § 272 he says, "Ex vena pulmonali in aspera vasa, ex his in venas libere liquor injectus it, reditque."

† Page 434.

‡ Observ. d'Anat. & de Med. prat. p. 55. p. 52. exper. 5.

“ plentifully through the whole mucous coat into the gut;
 “ whence we see there is a passage for the chyle to pass im-
 “ mediately from the cavity of the guts into the mesenteric
 “ veins.” His language elsewhere is, “Some of the ver-
 “ milion came always into the cavity of the bowels, though
 “ the injections were made with no greater force than that of
 “ the arterial blood. And it was the same, whether the in-
 “ jections were made by the aorta or vena porta, for in both
 “ cases the red streaks of vermilion might be seen with a mi-
 “ croscope in the papillæ of the mucous coat of the bowels*.”

THE injections of Kaau, who seems to have been not a little dexterous in filling the vessels, perfectly coincide with those already recited, in bespeaking, with clear voice, that sanguiferous veins do communicate with the several interstices. For he not only found water thrown into the venal trunks exude into the cavities, but made wax penetrate into them †.

LET us listen with an attentive ear to the suggestion of the great Albinus upon this head. And what is it? That he has injected wax not only from the arteries, but from the veins, into the intestines ‡. Let us listen above all to what that unrivalled injector Ruyfch has advanced relative to this point. And what is it? That wax thrown into the veins passes into the cavities ||.

I CANNOT here but remark, as a proof of absorption by red veins, which will, I think, have no small weight with the candid searcher after truth, that Kaau has explicitly affirmed he has frequently examined a piece of the intestinum jejunum

Hæmorrh. p. 123. 153.

N. 467. 472, 473. Consult n. 455. 800. 988. 454. 466. 474. 621. 706. 620. 619. 616, 617, 618.

† Diff. de Intestinis.

|| Th. max. n. 102.

filled

filled by Ruysch, preserved as a remarkable preparation by the eminent Boerhaave, in which his eye, assisted by the microscope, could clearly discern the injected wax fixed in the open extremities, not only of the capillary branches of the mesenteric arteries, but of the veins *.

HAVING shewn that the injections of those sons of anatomy, who shine with radiant blaze, unite in demonstrating that sanguineous veins perform the function of absorption, I proceed to suggest, in proof of it, some experiments of a different nature, but perhaps no less conclusive.—The expert and discerning Kaau opened the thorax and abdomen of a dog soon as dead; by gently compressing the stomach forced out its contents, and upon filling it afterwards with warm water, and lightly agitating it, in imitation of its natural action, saw the water absorbed by the small venal branches enter the larger gastric veins, diluting the blood they contained; saw it pass into the vena porta, and through the liver into the vena cava, which, with the right auricle and ventricle of the heart, became extremely turgid: then, tying the vena cava close to the heart, he made an incision under the ligature, through which the blood, pressed forward by the water, was first ejected, next water tinged with blood, last pure water. He continued to fill with water, and gently press, the stomach, till the whole vascular system was rendered devoid of blood, and pallid by the water absorbed.—When, in like manner, he injected water into the intestines, and applied an easy pressure, similar to the peristaltic motion, the water was forced into the mesenteric veins, conveyed to the vena porta, and through the liver to the vena cava †.

ADD to all this, as another experiment which pleads for absorption by veins carrying red blood, that tying or com-

* N. 475, 476.

† N. 478. 469, 470. 489, 490.

pressing them occasions cedematous tumours and dropfy; the lymph being thereby obstructed in its passage towards the venal trunks and the heart, and accumulated in the cavities. This is asserted in express terms by Haller *, by Kaau †, by that distinguished son of medicine Boerhaave ‡. Lower observes, a dropfy was produced in a few hours by a ligature made upon the vena cava ||. It is remarked by Willis, that tying the jugular vein causes a dropfy of the head §: that an œdema of the foot is the consequence of making a ligature on the crural vein, is the voice of Hoffman |||.

SHOULD our author reply to these proofs of sanguiferous veins absorbing, that they appear light when weighed against the experiments he has presented to the public in support of the contrary hypothesis, it is obvious to answer, let the hand of impartiality hold the balance, and the experiments I have adduced will be found above a counterpoise to his, evincing much more satisfactorily that the sanguineous veins do absorb, than those exhibited by him shew they do not.

DR. Hunter's experiments do not appear, upon mature reflection, to have that weight we at first view may be apt to allow them; for in those parts of the animal on which they were made, nature would certainly be disturbed in carrying on her nicer operations, nay, perhaps intirely prevented from it: such parts laboured unquestionably the whole time under a most violent disease; and there is no arguing conclusively from a morbid state with regard to what takes place in health.

* Prim. Lin. Physiol. n. 73. Elem. Physiol. lib. ii. sect. 2. p. 153.

† N. 636. 769.

‡ Prælect. Academ. in suas Institut. Rei Med. n. 307.

|| De Corde, c. ii. p. 82.

§ Pharmac. Ration. tom. ii. p. 125.

||| De Elastic. Fib. p. 17.

In many disorders several of the functions are apparently, for some time, quite at a stand, which certainly it would be in the highest degree rash to conclude from thence, were not carried on in the natural, sound condition of the body. Not to speak of the stupefying effects which ligatures made upon the vessels, according to Dr. Haller's experiments *, sometimes produce, might not perforating a part of the intestinal canal, the artery, and vein going to it, and injecting fluids into them through the wounds, obstruct the absorption by the branches of that vein, supposing them to open into the intestine? Might not the nerves be thereby injured, and a paralysis of the parts in some measure induced? Might not convulsions, might not a spasmodic constriction be thus occasioned? Are not these frequently the consequences of stimuli applied to different parts of the body? Even the contact of unusual fluids with the internal parts may, as the learned Van Swieten has remarked †, occasion a violent, convulsive contraction. That warm water, which was injected in several of Dr. Hunter's experiments, does produce this effect, is an indisputable fact: thus thrown into the stomach, it excites vomiting. And the acute Hales, in his experiments made upon dogs, constantly perceived them pierced deep with the sharp point of keenest agony, and strongly convulsed, soon as the warm water entered the vessels ‡. That the veins are, in fact, irritable, is certain from actual experiments: Senac applied stimuli to them; and what was the consequence? they were immediately contracted ||; this Zimmermann and Haller § frequently observed in their experiments.

* Mem. I. *Exposé Analyt. des Result. tirés des Experiences*, chap. iii.

† Sect. 232.

‡ *Hæmorrh. p. 115, 116, 154.*

|| Tom. ii. p. 227.

§ *Exper. 286, 288, 289, 291, 292,*

THE cold air admitted into the abdomen, and the perforated intestine, might constrict the capillary, absorbing orifices of the vein—or, rushing into the vein and artery through the apertures, might, when rarefied, obstruct the absorption of the fluid, or prevent its passing into the vein. Whether in inspiration the air in the vesicles, rarefied by the heat of the body, does impede the passage of the blood through the lungs, and so induce us to expire by relaxing the diaphragm and intercostal muscles, would be foreign to my present purpose to inquire: however that be, it is certain the most violent colics spring from rarefied air in the intestines confined by the constricted parts of the guts. The celebrated Van Swieten has known the iliac vein compressed to such a degree by the colon distended with air, as threatened even a mortification; the leg became tumid and benumbed: when the air was discharged, it recovered its sensibility, and was restored to its natural state *. This will render it not improbable that the rarefied air might have some effect in preventing or retarding the venal absorption.

IN making the experiments, it may be, he did not allow sufficient time for the veins to take up such a quantity of the fluid as could be easily discerned.—I think it is very reasonable to suppose, contrary to Dr. Hunter's insinuation †, that the branches of red veins do not imbibe so large a proportion of fluid from the intestines, as from other parts of the body, considering that the lacteals are a system of absorbents belonging to the intestinal tube; and therefore, though they did absorb, the share of the liquid taken up in the short time of making each experiment might be very small, too small to be readily perceived.

ONE principal instrument of carrying on the circulation is, doubtless, the action of the muscles: the pressure occasioned

* Sect. 649.

† Page 42.

by their contraction taken away, the motion of the blood in the veins stops or languisheth. Hence, after opening the abdomen of an animal, the veins, as the illustrious doctors, Boerhaave, Haller *, Van Swieten †, have observed, soon become extremely turgid with blood, through the want of the action of the abdominal muscles. Now, the pressure of these agents, it is in the highest degree reasonable to believe, is absolutely necessary to enable the venal branches going into the intestines to absorb, and certainly to protrude forward the fluid taken up. But in Dr. Hunter's experiments this requisite aid had little or no place.

THE vis vitæ of each animal subjected to the experiments declining as death approached, all the functions did of course likewise languish; consequently the absorbing power of the veins would in a short time be, if not intirely destroyed, yet greatly weakened, and that perhaps the sooner as they were perforated.

WHEN acrid fluids come in contact with the orifices of the absorbent vessels, they immediately close: thus, when the acrimonious bile poured into the intestines is applied to the lacteals, they instantly shut their mouths, and refuse to drink it in. Now musk, a solution of which was used in one experiment, is manifestly bitter and acrid to the taste, and is, unquestionably, a considerable stimulus, since given in the advanced state of a nervous fever, when languishing nature droops her head, it invigorates her, and raises the pulse: it is therefore highly probable the absorbing extremities of the veins, instead of imbibing it, would be constricted by it; nor does it appear certain that it was absorbed by the lacteals.

LET it also be observed, that the fluid effused into the cavities of the body is, perhaps, of a peculiar quality. And

* Mem. I. Exposé Analyt. des Result. tir. des Experiences, chap. iii. & vi.

† Sect. 213.

may not the all-wise contriver of the complex, stupendous human machine have adapted the venal branches to absorb that particular species of fluid, and no other? Coloured starch *, and milk, with which some of the experiments were made, might not be capable of entering their minute orifices. Pressure, we find, could not force this last fluid into them: and yet in one of the experiments, after the death of the animal, he made air pass from a mesenteric vein into the intestine. Does not this speak in intelligible language an open communication betwixt them? If, which there is good foundation for believing, the mouths of the venal branches were constricted in life, while the experiments were made, the spasm would be removed by death, and so a free passage into the intestine be occasioned.

THESE observations, if I mistake not, strike at the very root of Dr. Hunter's experiments, and demonstrate beyond all reasonable exception, that it is absolutely impossible to deduce with any certainty from them, or any experiments made in the same way, the conclusion that red veins do not absorb.

"BUT did not the lacteals take up the fluid thrown into a part of the alimentary canal?" Dr. Hunter says they did? but their orifices opening into the intestines very probably are larger than those of the venal branches, and therefore would not so readily be closed by a constricting cause, would more easily imbibe the injected liquid: besides, they were not wounded like the veins.

DID the lymphatics in Dr. Hunter's experiments absorb any of the injected fluid? This does not appear from his detail of them, though it be certain these veins are visible upon the surface of the intestines throughout their whole length. He

* Kaau gives it as his opinion, that coloured fluids too much astringe, and are too gross to enter the mouths of the absorbents. N. 487.

says,

says, in one experiment they were found turgid, being compressed by the ligature; I apprehend therefore it may with as much, nay, with greater colour of reason, be concluded from his experiments that the lymphatics do not absorb, than that the sanguineous veins do not; as the former received no wounds from the hand of the operator.

IN viewing through a microscope the circulation of the blood in various animals, Dr. Haller has sometimes observed two streams of blood flow in contrary directions, and meet each other in the same vein, which were quite different in colour: that returning from the heart was of a beautiful deep purple complexion; that coming from the intestines of a pale yellow *. Now, was not the lighter colour of this last stream owing, in part at least, to the mixture of the lymph absorbed from the intestinal canal by the veins?

PERMIT me to add farther, in confirmation of the opinion I am supporting, that it seems indisputable, and granted by all, even those who are advocates for absorption by lymphatics, that branches of sanguineous veins do rise from the cells of the penis, and imbibe the blood effused into them by arterial ramifications. Is it not then highly reasonable to suppose, arguing from analogy, that they likewise open into other cavities of the body, and perform there the office of absorbents?

NAY, which I deem an irrefragable demonstration of absorption by red veins, Dr. Haller in his dissections has actually discerned the absorbing orifices of the venal branches opening into the cavity of the uterus †.

* Mem. II. Sur le Mouv. du Sang, & sur les Effets de la Saignée. Exposé Synthétique de Faits. Exp. 13. 183. And Mem. I. chap. v.

† Opusc. Patholog. Obs. xxxviii. Hist. 3. p. 97.

LET now the discerning reader, influenced solely in his inquiries after truth by rational argument, weigh with attention the experiments I have produced; the reflections suggested to shew the invalidity of those adduced by Dr. Hunter; the arguments last urged, and I suppose he will readily allow, that the doctrine of absorption by the branches of veins carrying red blood is built upon a yet unshaken and solid basis; a basis incomparably more solid than that upon which the contrary hypothesis is erected.

As to the objection of the tenet of red veins absorbing, started by some *, that, as it seems clearly proved, the lymphatics perform this office, it does not harmonize with our ideas of the beautiful simplicity of the divine operations, to suppose that the wise contriver of our frame has formed another system of vessels for the purpose of absorption; this appears to me no more inconsistent with the thread of simplicity interwoven with his works, than his having made two kidneys for the secretion of urine, or two testicles for the generation of semen. And two systems of absorbents may be as necessary in the constitution, as two secretory organs of the same kind.

Dr. Hunter, in the fifty-eighth and fifty-ninth pages, has produced several cases that have fallen under his inspection, which, he says, establish his theory of the lymphatics, and demonstrate its utility in practice. Admitting they illustrate his hypothesis, they do not, I apprehend, prove that any advantage will flow to the medicinal art from it. The medical world was before well acquainted with the doctrine of absorption: nay, that the lymphatics absorb, though not confirmed before by so many and such solid arguments, was maintained by Glisson. And in my opinion, it will make no variation in practice, whether we admit that the lymphatics or

* Authors of the Critical Review.

Anguiferous veins take up the interstitial fluid. In the case mentioned by Dr. Hunter of a gentleman whose leg greatly swelled, through a collection of lymph after the evacuation from the wound in the groin ceased, he recommended cathartics, blistering, diuretics, sweating, perspirative fomentations, friction, an elevated posture of the affected limb; and would not the doctor, or any judicious practitioner, have prescribed this method of cure, even upon the supposition that the ramifications of red veins suck up and return the lymph? In the different species of dropsy, to promote the absorption of the collected water, we administer stimulating emetics, purgatives, diuretics, and attempt, by the exhibition of the most powerful corroborants, to strengthen the absorbent vessels, and so enable them to drink in the fluid deposited in the cavities, besides several other means of effecting a cure; and will it make our practice in this instance flow in a new or better channel, that we believe the lymphatic veins act as absorbents?

N° XXXVII.

Extract of a Letter from John Huxham, M. D. F. R. S. to William Watson, M. D. F. R. S. dated at Plymouth, Febr. 5, 1762, relating to two remarkable Cases in Surgery.

S I R,

I HAVE sent you inclosed two pretty remarkable cases from Mr. Thomas Adams, an ingenious and experienced surgeon at Liskard in Cornwall: that of the cut throat may serve to make us somewhat more ready and resolute in the operation of bronchotomy, when necessary. How right Mr. Adams may be in his conjecture of the effects of the sheep shears, I will not say; but from many well-known experiments, par-

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ticularly

ticularly that of Mr. Franklin, it seems not altogether improbable.

JUNE 12, 1747, I was sent for to assist John S——r of the parish of St. Clear: the messenger informed me he had cut his throat from ear to ear. When I came to him I found a very large wound, near seven inches long, three parts round his neck; the trachea cut almost through; but the knife had luckily escaped wounding the jugular arteries: no considerable hæmorrhage ensued, and that was intirely stopped. I endeavoured a re-union of the parts by future, which I performed in the following manner: I first made two stiches through the external parts of the windpipe, which I conveniently performed, as the wound admitted of introducing my fore finger and thumb into the trachea, and left them untied till I had brought the two ends of the wound into contact by future; then tying the two stiches, it had a fair aspect for re-union, which, by superficial dressing and bandage, was completed in a month's time. As soon as I had dressed him he was able to speak, and informed me, as well as his neighbours, that his wife had made that desperate attempt on his life in a wood, coming from her father's house to the place where she was servant, by first blindfolding him with handkerchiefs, and then, under pretence of taking measure to make a new shirt for him, took off his stock, unbuttoned his collar, cut his throat, and then ran from him. After he had been about a fortnight employed about his business as a carpenter, he complained of a troublesome tickling cough, and loss of appetite: his complaints grew worse, and I was fearful of an ulcer being formed internally, as he had every appearance of a consumption; but coming one day to me, he complained of a foreness externally. On examining I found a little matter formed, and on opening it extracted a little silk, about the length of a small pin, which relieved his complaints intirely. He lived two years in perfect health, and died of the small-pox.

JUNE 28, 1756, I was desired by the parish of Duloe to attend Charles R——s, who, two days before, had been struck by lightning. On my examination I found it had pierced through his coat, waistcoat, and shirt, a little above the middle of the deltoid muscle of the right arm: it had burnt to tinder almost all the sleeve of the shirt, waistcoat, and inside of the coat sleeve, but the outside appeared untouched, except where the lightning pierced. The flesh of his arm, from the shoulder to the elbow, was burnt, especially where the lightning pierced, a full inch deep, and onwards to the wrist and fingers less and less deep, till it did but just destroy the scarf skin. It pierced again near the umbilical region in a different direction, but not so deep; his thighs were burnt in various directions, but not so deep; from the right knee downwards, on the outside, it first burnt the hair, then the scarf skin, and continued on deeper, especially about the ankle and instep of the foot; the left leg much in the same manner on the inside, but not so deeply burnt. His waistcoat, breeches, and stockings were burnt on the inside as his coat sleeve, and the outside appeared untouched: his buckles melted in his shoes in various directions. In this deplorable condition, his arm and the other parts appearing greatly inflamed, I bled and gave him a purging draught to empty his bowels, and the next day put him upon the use of the bark, the applications were a warm, spirituous bath and the common digesters; by these means there was a separation begun; in two days the edges of the burnt parts beginning to separate, when I thought to assist nature by deep scarification, but to my great surprize, I could no more thrust my knife through the burnt part than through hide leather, or a thong; by which means the separation was rather slow, and the stench intolerable. By the end of July he was able to walk abroad, and about the middle of August perfectly healed.

REMARK.

REMARK.

THE lightning came through the upper part of the window, a pair of sheep shears lying in the window behind his back, which, I imagine, collected and threw it in such various directions about his body: another man sat by him, who was slightly struck about his neck and left shoulder. It is remarkable, while the man of the house went to his cellar to draw a jug of cyder, on his return he found his wife and children on the floor, and the two men fallen forwards, with their faces on the table, all insensible; and the man so much hurt recovered his senses first.

N° XXXVIII.

On the ill Effects of eating large Quantities of Fruit.
By Giles Watts.

I WAS desired in March to call on two children, whose sister, a child of about two years of age, died a few days before of the same disorder under which these two surviving ones now laboured: the eldest of these, a girl about seven years old, was at this time in the last stage of an ascites; the abdomen was distended in a most extraordinary manner, and I could plainly feel a fluctuation of liquors in it; she breathed with extreme difficulty, especially when lying down; passed very little urine, complained of great thirst, was excessively emaciated, and * vomited almost all the aliment she took (a

* Notwithstanding this be, generally speaking, a dangerous and terrifying symptom in the dropsy, especially where it takes its rise from a long continued course of intemperance, and consequently is owing to a real weakness of the ventricle; yet I am persuaded it ought to be far from deterring us from the operation of the paracentesis in those cases, where we have reason to believe it proceeds from the over-distension of the abdomen, and which, I dare venture to say, is pretty frequently the case.

symptom

symptom surely of great danger in most lingering chronic disorders); in short, her condition was intirely desperate, and indeed she died in about a fortnight after.

ON inquiry I found all of them were seized nearly about the same time, to wit, about Michaelmas last, with the following complaints, viz. frequent cold rigors, succeeded generally by feverish paroxysms, but observing no regular periods of time with regard to their returns; dry cough, great thirst, frequent vomitings, pains in and distension of the abdomen, &c. Now, as these symptoms had increased much faster on the eldest and youngest than on the other, the parents applied on their account pretty early in the disorder for relief, and many medicines had been exhibited, but without the least success, since they grew daily worse and worse; in short, the youngest died in about four months from the first invasion of the disorder, just in the same condition as was that of the eldest, whose case I described above.

As it was pretty extraordinary for three only children of the same parents to be all seized at one and same time with the same lingering disorder; as one was already dead, another as it were dying, and the other not likely, in all outward appearance, to survive long, the whole neighbourhood was alarmed, and the father advised to seek further for relief before it was too late. The mother informed me that the last-mentioned one (a girl of four years of age) had from the beginning of her illness been troubled with the same complaints as the other two, with this difference, that though her appetite for food had been worse than theirs, yet her other symptoms had been somewhat less violent: when I saw her, her belly was very hard and much distended, her breathing somewhat laborious, and indeed greatly so on motion, to which she was now very little inclined, being very listless and inactive, though before her disorder sufficiently pert and lively: she made very little water, had frequent returns of
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those cold rigors and feverish paroxysms, complained much of her belly, and was almost insatiably thirsty. From this superficial account of the symptoms that attended these children, added to the above-mentioned remarkable circumstance of their being all taken ill immediately after the season of fruit (on which they had been observed to feed very freely) it is sufficiently manifest that I had great reason to conclude their disorder had taken its rise from worms; and of this indeed I was so firmly persuaded, that I immediately put the last-mentioned child in a course of *æthiops miner. & stann. pulv. ana* $\mathfrak{z}$ q. part. which I purged off, at proper intervals, with the *pulv. è scamm. C. and calomel*; the consequence of which was, that in a few days she passed four of the *lumbrici teretes*, and the violence of the symptoms soon began to abate; so that in the space of three weeks the child was in every respect much better, and is now in a pretty good state of health. I had almost forgot to mention the following circumstances, to wit, that notwithstanding the desperate situation of the eldest, I ventured now to give her a dose or two of the *pulv. è scamm. C. and calomel*, together with a few papers of the anthelmintic powder, which, though not followed with the wished-for success, had however the good effect to bring off by stool two large worms; but, alas, her case was far beyond the reach of medicine; and they informed me that the youngest had likewise, in the course of its illness, voided some of the same kind of vermin: so that here was, over and above the many concurring symptoms of worms that attended each child, ocular demonstration of them. Now, since it is an established maxim in physic, delivered down to us by the greatest practitioners, that in all, especially the more anomalous disorders of children, we are ever to suspect worms (for even the most violent disorders that afflict this tender age, are frequently excited by this ugly vermin) since each of these children actually voided some of them; but more especially since the disorder of the surviving one so evidently and immediately remitted its violence on her passing them, I think we
may

may safely conclude that their illness was owing to them; and indeed, though the * disorders that are produced by worms in the intestinal canal seem, generally speaking, to proceed from irritations and erosion of the sensible nervous tunic of the guts, yet I presume, on a serious reflection, we shall find it no difficult task to explain the method by which, in all probability, they may produce even a fatal dropsy, a disorder, it must be confessed, widely different in its nature from the more common effects of worms on the human body. It is a noted observation in physic, the truth of which is confirmed by daily experience, that worms are ever attended with a tumefaction of the abdomen: now, though this symptom is generally thought to proceed from the costiveness that frequently attends worms, yet to me it rather seems to proceed partly from the † irritation they make on the intestines (and that mere irritation of these parts is of itself sufficient to excite inflations of them, and consequently distension of the abdomen, is abundantly evident from the observations the accurate Dr. Sydenham made on the case of the dropsical woman; in which he tells us, That though his patient used, by the means of cathartics, to discharge a gallon of water in one and the same day, yet she soon began to swell again, and that this tumour always continued, till that hurry and ataxy of spirits which the cathartic had raised, was intirely subsided, at which time it disappeared, and gave no farther disturbance till excited afresh by another purgative; and that therefore it was his opinion this symptom could proceed from no other cause than those flatulencies which cathartics generally excite) and partly from the large quantities of small liquors which the almost insatiable thirst of these patients frequently obliges them to drink. Now, if we consider that it is the weakly,

* Fevers, convulsions, vomitings, &c.

† I presume the more ordinary tumefactions of the bellies of children troubled with worms proceed from this cause.

puny, and, it is generally imagined, those children in whom especially the concoctive powers are so feeble, as to be altogether incapable of dissolving, grinding down, and consequently preventing the maturation of those vermicular ova, which all necessarily take down in considerable quantities with their ordinary food, who are by far most subject to worms; and that the drinking such large quantities of small tepid liquors, as is here generally speaking the case, greatly relaxes the muscular coats of the ventricle and intestines, weakens the digestion, and thereby mediately affects the crasis of the blood; and that, by filling the circulation with so thin and aqueous a menstruum, it must not only immediately relax the whole vascular system, and consequently weaken the circulating, or that force by which the various secretions and excretions are for the most part performed, but must likewise so impoverish, dilute, and melt down the whole mass of blood, and * overload the circulation, that the more minute parts of this fluid will run off *qua data porta*, or by the most obvious outlets of the lateral vessels; no wonder if it be discharged in considerable quantities into the cavity of the abdomen, since we have the greatest reason, not only from the † consequences of inflammations of the peritonæum, and obstructions of the numerous exhalant vessels that are disposed on that membrane, but likewise from the noted experiment of injecting a quantity of warm water into the abdomen of a dog, and opening it soon after (by which we find the whole taken into the circulation) the greatest reason to believe, that

* By making a ligature on any large veins, and by that means intercepting the blood in its return to the heart, we excite an hydropical tumour of that part to which the extreme ramifications of such vessels are distributed: now, if this be the immediate consequence of surcharging the vessels with a rich dense blood, how much more easily it will happen from an over-distension of the vascular system by a thin, impoverished, and ichorous blood, is no difficult matter to determine.

† Viz. Preternatural adhesions or accretions of such inflamed parts to one another.

in health there is a pretty brisk * circulation of lymph between the exhalant and reſorbent veſſels of this cavity, i. e. that as the former are continually emitting a conſiderable quantity of liquors, ſo the latter are as continually re-conveying them into the circulation. Now, if it be granted me that the exhalant veſſels of the abdominal cavity in theſe patients emit only their bare proportion of liquids (and, from ſome conſiderations, I queſtion whether they do not much more) yet, as the imbibing power of the reſorbent veſſels, now that the circulation is ſo extremely † languid and overloaded with fluids, muſt be very weak, or rather intirely deſtroyed, a gradual collection of extravafated liquors muſt indifpenſably be formed in this cavity. Nor is it leſs evident from the known effects of moderate exerciſe on animal bodies, that all and every of the above-recited cauſes of the gradual collection of extravafated liquors muſt be greatly aggravated by that remarkable liſtleſſneſs or averſion to motion that generally prevails in theſe caſes; thus we ſee a fatal diſorder, nearly a-kin to the aſcites, never fails to be induced on the tender bodies of young hares, rabbits, &c. if at the ſame time, whiſt they are fed with plenty of moiſt food, they are likewise debarred their wonted exerciſe: a circumſtance ſufficiently known to all who have been concerned in feeding theſe creatures whiſt confined in hutches, &c. Now this extravafated liquor will

* The final uſes of this circulation are, doubtleſs, to prevent the accretion of the various viſcera contained within the abdomen (a circumſtance that ſeldom fails to be the caſe, whenever their exhalant veſſels are by any means obſtructed) as well as ſo to ſoften and lubricate them, that the frequent attritions on one another, to which they are on ſeveral accounts neceſſarily ſubjected, may be performed with the leaſt degree of friction imaginable.

† “ That power, which phyſicians generally now-a-days call Abſorption, “ whereby the ſmall open orifices of veſſels imbibe liquors lodged in the cavities “ of the body, is obſerved to increaſe or diminifh proportionally to the ſtrength “ or weakneſs of the creature.” And below, “ When the body turns weak, “ the exhalants pour out ſo much more than the abſorbents can take in, that “ all the cavities are found to contain conſiderable quantities of liquors.”
Monro. Vid. Med. Eſſays, vol. ii.

not only by its * pressure prevent the free secretion of urine by the renal apparatus, but will also by its emollient quality greatly relax and weaken the numerous vessels that open into the abdomen: circumstances which will tend considerably to increase its present tumefaction, since the circulation will not only be hereby further loaded with aqueous liquors, but likewise all such surplus of water be determined in its course, particularly through these now greatly-relaxed vessels, into this cavity, as well as the resorbing quality of its veins be still further impaired. To all which considerations if we add the great probability there is of the guts being perforated in many of these cases, especially those attended with the lumbrici rotundi, which so remarkably infested the above-mentioned patients, and which, by their † make, seem in a peculiar manner adapted for such mischievous work, we shall have still less occasion to be surprized at the above-mentioned miserable consequences of these vermin; since on such an accident, over and above the many concurring causes already recited, the case would necessarily be attended with these aggravating circumstances, that, while the present moles of extravasated liquors must indispensably be increased by the addition of the chyle, or liquor composed of the aliment, hepatic and cystic biles, pancreatic juice, &c. (which, in its passage through the intestinal canal, would, doubtless, make its escape at these preternatural openings) the other parts of the body, being thus robbed of their usual nutritious juices, would consequently become still more and more emaciated: and that

* Thus I have not only frequently observed that patients, immediately after the operation of the paracentesis, begin to pass much larger quantities of urine than they did before, but likewise that the quantity of urine becomes gradually less and less, in proportion as the abdomen grows more and more turgid with a fresh collection of liquors: circumstances which seldom or never fail to occur, and are, in all probability, owing to the greater or less degree of pressure made by the contents of the abdomen on the emulgent arteries, &c.

† See Vallisnerius's description of the teretes, in Le Clerc's History of Worms.

this

this was the * case with the two children above-mentioned, I was somewhat inclined to believe, as well*from the extreme distension of their bellies, as from the remarkable macies that was so observable in both; though at the same time it must be confessed these circumstances were very far from necessarily implying any such perforations.

Nº XXXIX.

To the Authors of the MEDICAL MUSEUM.

A remarkable Worm Case, with Exomphalus, and on Dissection of the Body an uncommon Appearance found in the Stomach, &c.

GENTLEMEN,

INCLOSED I send you an extraordinary case which happened in the month of July 1757.

A GIRL about twelve years old, of the parish of Carhampton, in the county of Somerset, was seized with a violent pain in her stomach, attended with a dry, troublesome cough and hectic heats. After these symptoms had continued with increase about a fortnight, I was called to her assistance: judged it to be a worm case she was ordered anthelmintics, by which several large worms were discharged and many ascariides, and the patient was somewhat relieved for about a week: however the pain of the stomach returned with its usual violence, and all the symptoms were augmented. I endeavoured to prevail on her to repeat her worm medicines, but to no purpose; the girl was so averse to them, that I

* From this notion I was led to be very urgent with the father to gain the liberty of opening the eldest child, but I was not permitted to do it.

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omitted visiting her for about three weeks, at which time her guardian informed me that a tumour in the child's navel had burst, and had discharged some pints of matter: I visited again, and found two small holes close by the navel, through which a thin matter, of the consistence of whey, was copiously discharged, and continued without abatement for a fortnight longer, when the patient died a perfect skeleton. Being permitted to inspect the body, I laid open the abdomen (in the presence of the learned Mr. Lemuel Bradley of Dunster) where nothing could be seen but a vast quantity of a substance much resembling a cataplasm made of bread and milk; I got a spoon and took away almost a chamberpot-full of this substance, amongst which I saw here and there a piece of carrot and of apple.

THE omentum was nothing but a membrane quite destitute of fat, and adhered so firmly to the intestines, that it could not be separated from them without laceration: the liver also had a morbid adhesion to the right side of the abdomen, yet in other respects found. But when I came to examine the stomach, I found a hole in the bottom of it, through which a turkey's egg might pass with ease, and through this hole whatever the girl eat was quickly discharged into the space containing the intestines, and there had formed a collection which almost filled up the whole cavity. I am of opinion that this mischief was occasioned by Worms, and am desirous this case should be made public, as a warning to mankind never to neglect, by proper medicines, the destruction of these pernicious and intestine enemies.

I am, GENTLEMEN,

Your humble Servant,

Minehead, July 29, 1763.

JOHN SHORT.

N^o XL.

An uncommon Case of an Hæmoptysis. By Erasmus Darwin, M. D.

To the very honourable and learned the President and Members of the Royal Society.

GENTLEMEN,

THE following case of discharge of blood from the pulmonary arteries appears to have been owing to a cause different from any mentioned amongst the writers of medicine; and as from the knowledge of that cause the cure was so easily deduced, I flatter myself you will not esteem it unworthy your attention.

A GENTLEMAN residing near this place, between forty and fifty years of age, of a pale and meagre habit, has been daily afflicted with violent head-achs for several years past; and about four years ago, after having taken a considerable quantity of Peruvian bark, became suddenly paralytic: the use, however, of his right limbs was so much restored, as only to remain weaker than the other, when, upon suddenly awaking from his sleep about two o'clock in the morning (May 7, 1759) he spit up four or five ounces of florid blood. He immediately lost twelve or fourteen ounces from the arm, had elixir of vitriol given him, and in the evening had a clyster, and lost blood again to about ten ounces.

ON the eighth, about the same hour, he again suddenly awaked, and spit about the same quantity of blood as before. He was now advised to increase the quantity of elixir of vitriol, had a bolus of extractum Campechense every six hours, and had a leech applied to a blind pile that had long appeared after going to stool.

ON

ON the ninth, at the same hour, he had again the same discharge as before. That these hæmorrhages were from the pulmonary artery rather than the bronchial, appears from the sudden expuition, the quantity, the floridity, and from the discharge being without pain and unmixed with phlegm.

As he had no feverish symptoms, either when he first awaked, or during the day, no more blood was taken from him; and as he constantly slept profoundly from ten o'clock till two, when the complaint seized him, he was now advised to be awakened, and rise out of his bed at one in the morning, and remain awake till three, omitting all medicines.

HE continued to rise from bed for a week, and has ever since used himself to awake at the same time, and has not only been intirely free from this complaint, and that without any further discharge from the hæmorrhoidal vessels, but has got more flesh, and his head-achs are become even inconsiderable.

I OUGHT not here to omit, that he had a vomit given him on the twelfth, and twice repeated, at the intervals of three or four days.

As the patient from a former hæmiplegia had, in all probability, many parts of his body rendered less irritable than is natural, and as he constantly slept profoundly, and the hæmoptoe always awaked him after four hours sleep, I was led to conclude, that during this sleep the lungs were not sufficiently sensible to push forwards the whole circulation; and that hence the blood gradually accumulated ruptured some minute branches of the pulmonary artery before the uneasiness became great enough to awake the patient: and as much as the evidence of a single case in medicine may be estimated, the successful cure would seem to evince the truth of this doctrine.

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I HAVE only to add, that the anxiety with which patients reduced to great weakness awake from their sleep, and the hurried pulse, have by others been observed to be owing to an accumulation of blood in the lungs during their state of decreased sensibility; and how detrimental, in these cases, might be the administration of opium or nitre, whilst the want of sleep, or the recurring hæmorrhage, might seem to the unwary practitioner to need their assistance.

AFTER a few days, observing some cough remain, it seemed advisable to give two or three vomits, as, from late experience, they do not endanger a renewal of the discharge, and must promote the expectoration of the eschar, or any extravasated blood, which otherwise by its delay acquiring a putrid acrimony, perhaps, most frequently erodes the contiguous vessels, and, forming new ulcerations, becomes the general cause of consumptions, subsequent to accidental spittings of blood.

I am, GENTLEMEN,

Lichfield,

Your very humble Servant,

Dec. 17, 1759:

ERASMUS DARWIN.

N° XLI.

Experiments shewing the Cause of Motion in the Heart. By Albert Haller, Aulic Counsellor, first Physician to his Majesty as the Elector of Hanover; and President of the Royal Academy of Sciences at Gottingen.

[From the first Volume of the Memoirs of that Academy, just published.]

WHAT I am now about to write may not be intirely void of utility: it contains a relation of an experiment which I have often repeated, shewing that the Heart

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derives its Motion alone from the stimulus communicated by the influx of the venous blood; from whence it is perpetually contracting and expanding; for which several reasons have been assigned, all which are easily refuted both from the human, and from comparative anatomy.

It was well known that the right ventricle and auricle of the heart have been usually considered as that part of the whole body which survives the longest; and so the immortal Boerhaave * concludes, after the experiments of Galen † and Harvey ‡.

I LONG ago suspected that this perseverance of Motion was occasioned solely by the constant afflux of blood from the *venæ cavæ*, contracted by cold, and compressed by the final palpitations of the contiguous muscles and the weight of the incumbent ones; whereas nothing can flow into the left auricle and ventricle, because the lungs of a dying animal ceasing to move, can transmit nothing from the right side of the heart; nor indeed is that which the right side itself receives any great matter, in comparison with the quantity returned from the whole body towards that side: so that it should seem that the right auricle and ventricle do persevere longer in a state of contraction than the left, because they are longer stimulated by the venous blood.

I RESOLVED to put this conjecture to the test of experiment, believing, that if it were possible to divert the blood from the right ventricle and auricle, and that if then the right side should cease to move, it would begin to appear that the cause that set the right side in Motion, was the afflux of that same venous blood, by whose absence its whole Motion was destroyed.

* *Instit. Rei Med.* n. 159.

† *Admin. Anat.* lib. vii. c. 15.

‡ *Diff. I.* p. 39. 44, &c.

I BEGAN with ligatures, remembering to have read in Bartholine and de Berger, that when the veins were tied, the Heart itself stood still, and being untied, it resumed its Motion ;—and Harvey made the same experiment upon a serpent.

THIS manner of trial, however, seldom succeeded, because in a warm animal the blood already received into the right auricle, is there capable of continuing a stimulus, though no more be thrown in from the *venæ cavæ*. I found at last, upon tying the *cavæ* of three kittens, that the blood continued still in Motion ; and the consequence of M. Blanguet's experiments, cited by Dr. Senac, was much the same ; I therefore cut both the trunks of the *cavæ*, and squeezed the blood from them, as also from the auricle and thalamus, and then I tied up the ends of the trunks, lest the inaction of the auricle might be ascribed to the laxity of the muscular fibres adhering to the divided veins. The blood being thus emptied, and a new influx provided against, the experiment never failed ; but the right auricle collapsed in an instant, as if thunder-struck, without the least tendency to motion. In the right ventricle, which it was difficult intirely to evacuate, and which the left ventricle had some little influence upon, there was indeed sometimes a small and just sensible Motion, but nothing to compare with that which is manifest in the same, when the venous blood meets with no obstruction in its entrance into it.

BUT the most decisive experiment is to come. In the natural state the right ventricle and auricle persist in their Motion, whilst the left are at rest, because they are irritated by the blood, none of which possesses the left : now, if we can contrive to shut out the blood from the right ventricle and auricle, and hinder it from quitting the left ventricle, and by thus retaining the stimulus, cause the Motion of this left ventricle to subsist, there can seem no doubt but that the Motion of the Heart depends upon the stimulus of the blood.

To arrive at this point I was obliged, after cutting the veins, to open the pulmonary artery, that I might perfectly empty the right ventricle of its blood, keeping the left ventricle full by a strong ligature on the aorta; and then, to observe whether the right ventricle was at rest, and the left, together with its auricle, in motion.

AFTER a few trials, which through the difficulty of the practice and the quick death of the animals miscarried, every thing answered my expectation, there being an absolute rest in the right auricle, and scarce any motion in the right ventricle, but what might fairly be imputed to the fibres which connect the two ventricles. When the experiment was made to a greater degree of accuracy, the blood appeared to ascend from the point of the right ventricle, and then to descend from the upper part of that base, and at that instant the right ventricle, if it had any motion at all, seemed also to descend: at other times, the right ventricle kept absolutely at rest; nor could it be otherwise, when, by the left auricle's having emptied itself into the left ventricle, the thalamus, as the aorta was tied close, had no room for depositing its blood; but the point of the left ventricle returned its motion the longest of all. And according to this process, the part which kept longest alive, which is commonly the right auricle, was now the left ventricle, that being the longest kept stimulated by the blood.

THE experiment may be somewhat strengthened by inflating the right ventricle already at rest; for by so doing it will begin its pulsation again from a restitution of the stimulus. I always found that the internal surface of the Heart was more susceptible of irritation than the external; for the latter, when stimulated even with strong poisons, and so set a-going afresh, would stop again after a few palpitations, whereas the inward surface, excited by bare inflation, would recover, especially in frogs, and sometimes in cats, a good degree of motion, when all the other parts were grown cold,

I REPEATED the experiment for communicating the last remaining vitality to the left ventricle nine times; seven in cats, and two in kids, these being the properest subjects; for the violent struggling of dogs renders them unfit for the purpose.

N^o XLII.

The Consultation of Mons. Fagon, first Physician to the late French King, upon the Disorder of Mons. Bayle.

A PERSON cannot without concern hear, that an indifference for life has engaged the illustrious M. Bayle to neglect the progress of a distemper, the least symptoms of which are formidable. It must be an happiness to him not to have made use of dangerous remedies; but a proper regimen (which is the principal) can never be deferred in these cases without extreme danger. By a consumption physicians understand a decay or ulceration of the lungs: M. Bayle's immense labours of the mind give room to fear their decay: the winter, wherein the defluxion began, and its perseverance, give great suspicion of the impression that an acrid serosity, which has thrown itself upon the lungs, may have made on their substance. The cough frequent and dry, or else attended with serous, bloody, or purulent spittle, may decide it. Nothing enters immediately into that part, but the air by respiration, the rest arrives not there but with the blood by circulation: a person must therefore have great attention to the air that he breathes, and to the aliments with which he is nourished, and make use of those two means to introduce agreeable remedies into the lungs.

THE air should be of such a temper, as to be neither too piercing nor heavy; that which is filled with salt exhalations
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is pernicious to distempered lungs, and that wherein there are such noxious fumes as rise from turfs burnt, &c. is not less dangerous: he must avoid also that which is moist and frowzy, and for this purpose should not inhabit apartments which are on the first floor. Cold and excessive heat are equally to be feared, especially the heat of stoves, which drive into the air mineral particles that cannot be breathed without hazard. A fire of wood in a chimney that does not smoke, and which renews the air without infecting it, is the only agreeable one, provided it be moderate, day and night, and that the person is at such a distance as not to breath the salt of the wood, and yet so situated as not to suffer by the cold, taking care sufficiently to cloath himself that he may not feel it; it is of great importance to prevent this in the night, particularly by covering the head, the neck, and the back, so as not to perceive the cold that always chills the air at the dawn of the morning, and which fails not to awaken the cough in these cases. I recommend for this purpose not only thick curtains that shut close, but a pavilion under them fixed to the four bed-posts, and which closes on the person laid down, and only contains the air that is commodious for respiration, and to keep it temperate all the night by the natural heat of the patient and by the external fire of the chamber: this care regards not only the temperature of the air which we breathe, but also that on which the general transpiration of the whole body depends, a freedom which is of infinite consequence to carry off from the breast the acrid parts of that serosity that soaks it; which, if it were stopped by the cold air that closes the pores of the skin, would much more dangerously return upon the lungs than in the direct attack. But it is not sufficient to hinder the air from increasing the distemper, we should attempt to fill it with that which may serve as a remedy, that so it may carry it with it into the lungs: if then there appears an ulcerous disposition in M. Bayle's case, by spittle tinctured with blood or purulent matter, and in order to charge the air with something balsamic, and which may

penetrate immediately with it into the lungs, it is proper to diffuse in it many times in a day the smoke from a mixture of equal parts of mastic and carabe burnt upon red embers, and to order it so that the particles which ascend from that smoke may insinuate themselves at a distance from the patient into the air of the chamber, that so they may be gently breathed them to cough or sneeze; or we may take a little of the subtile powder of the same mixture, and having put it in a thin silk bag, by gently shaking it spread abroad in the air a little of that balsamic powder or dust, with the like precautions, to make him breathe almost imperceptibly. But if a cough, dry and convulsive, shews the arid state of the lungs that are damaged by the stypticity of the salt, which has begun to prevail in the humours, as the spirits (dissipated by the excess of study) have ceased to temper them, the use of emollient and vulnerary decoctions will be more agreeable: recourse may be had to these in boiling the leaves and roots of marsh-mallows, the leaves and flowers of colts-foot, the flowers and slices of the roots of nymphæa, the flowers of mullein, linseed, with camomile in milk and water. He should draw in (often in breathing) the vapour of that decoction as it smokes, and as near as he can conveniently.

WHILE we carefully attempt by these methods to serve the lungs with all the succours that can be drawn from the air, we should not be less attentive to make all the advantage possible of those we may hope for from the blood that contributes to the nourishment of them, and (which without ceasing flows with rapidity through the fine capillary vessels) in rectifying it by the choice of good aliments, and procuring to it, by the mixture of some balsamic substance, the means of contributing to the re-establishment of the breast. The aliments proper to that purpose should be very soft, simple, and easy to digest; such as fowls boiled or roasted, if M. Bayle is in a condition to use solid nourishment; if not, chicken-broth with rice, light soups, fresh eggs, jelly of

hartshorn or of chickens, and other things of like nature; milk, as well for its softness as for its consistence, and its easy conversion into chyle, would be most agreeable for all his nourishment, with good bread, light, not sharp, and without barm, if the habitual fever which ordinarily accompanies those attacks of the breast, and which increases after a meal, does not hinder the good effect of it by souring and corrupting it: but it is my custom to substitute in its place a kind of broth, mixed with an emulsion, which supplies that which we may hope for from the softness of the milk, and which carries into the blood something balsamic, so far as to make it a kind of vulnerary remedy when it passes into the lungs. This broth is made with one chicken, with half a pugil of rice, and a little bit of the root of comfrey; the whole well boiled; we then pound apart a dozen and half of pistachios, good and fresh, a drachm of white poppy seed, from which we draw the milk, with four or five ounces of a light decoction of the heads of white poppy; and to this may be added half an ounce of sugar-candy powdered.

WITH this emulsion an equal quantity of the broth prepared must be mixed, and the mixture should be taken warm as common soup in the morning for breakfast, and at night going to bed for supper; but before the morning dose is taken, he should swallow in a bolus one drop of the excellent white Arabian balsam, commonly called balsam of Judea, rolled in sugar, and the broth after it; at night, lying down, he should take the same dose, only adding to the bolus one fourth or sixth part of a grain of laudanum, as occasion requires, and take the broth emulsionated after it. That little dose of laudanum is added to prevent or appease the cough, which commonly renews itself at those times, and continues with so great obstinacy sometimes through the night, that a person is obliged to have recourse to one or two other quarters of a grain of laudanum once in two hours, to appease the convulsive irritation which keeps up those sorts of rebellious

lions coughs, which tear the breast, and hinder the sleep that is necessary to render smooth and digest the serosity that hurts the lungs, and to deliver them of it by a more free transpiration, which it procures. If by that conduct he may gain the return of the herbs with the spring, which renders the milk much better, it will be proper then to try whether cow's milk mixed (to preserve it from souring) with two or three spoonfuls of warm water (that has been boiled before) will pass without curdling, and furnish (with bread only) a soft and sufficient nourishment: however it is proper, in order to prepare for it, and to facilitate the sweetening of the blood by the regimen proposed above, to drink neither wine, cyder, nor beer, or any other fermented liquor, lest in turning sour they should hinder the smoothest aliments from taking away the sharpness of the blood. One may, instead of those liquors, prepare a good one with the shavings of hartshorn slowly stewed in a little water upon hot cinders, and boiled afterwards with a little dog's grass and some fresh good dates in a sufficient quantity of water to make a light drink, which must be renewed every day. I passionately wish that we could spare all this constraint, and that it was possible to find a remedy as singular as is the merit of him for whom it is demanded; such as might cure him without subjecting him to a weary attention to so many circumstances; but it is so difficult to prevent the intire ruin of a nervous part, such as the lungs, hurt by that which surrounds them continually, that we must not complain of the little cares which an affair of so great importance demands.

Verfailles, Dec. 27.

FAGON.

N^o XLIII.

On Sugar, and how it may be obtained from different Vegetables in England, &c. By Casper Newman, from Dr. Lewis.

SUGAR is the essential salt of a species of reed or cane (*Arundo Saccharifera*, C. B.) growing spontaneously in Africa and Asia, and cultivated in large quantities in the English, French, and other European settlements in the warmer parts of America, where all our Sugar is prepared. A kind of Sugar is obtained in the East Indies from certain trees and vegetables; and some of our own plants also afford a saccharine concrete *,

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* Sugar from certain trees, &c.] In some parts of North America, particularly in Canada, a kind of Sugar is prepared from the juice which issues upon wounding or boring certain species of the maple-tree, one of which is named from hence the Sugar-maple; as also from the wild or black birch, the honey-luccust, and the hickery. The maple is most commonly made use of for this purpose, as being the richest, and as best enduring the long and severe winter of that climate: the juice is boiled down, without any addition, to a thick consistence, then taken off from the fire, kept stirring till the heat is abated, and set in a cold place, where the Sugar quickly concretes into grains, resembling common brown powder Sugar.

The trees are tapped early in the spring, about the time that the snow begins to melt: it is observable, that when the weather begins to grow warm, they bleed no more, and that after the bleeding is stopped, they begin to run again upon covering the roots with snow. The more severe the winter has been, the juice is found to be the richer and in greater quantity: the trees which grow on hills or high lands yield a richer juice than those which are produced in low countries, and the middle-aged than the young or the old. Mr. Kalm informs us, in the Swedish transactions for the year 1751, that one tree, if the summer comes not on hastily, will yield about forty-two gallons of juice (English wine measure) and that the quantity which issues in one day is from three to six gallons; that eleven gallons of juice of middling quality give a pound of Sugar; and that sometimes a pound has been gained from three gallons and a half: that two persons can in one spring prepare commodiously two hundred pounds. He observes, that this Sugar is weaker than that from the Sugar-cane,

but

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THE Sugar-cane arises to the height of five or six feet: it has long leaves, sharp at both ends, and produces in the middle a kind of arrow, bearing silver-white flowers; it sends out suckers from the roots, by which the plant is propagated. When the cane is ripe, it is cut down, cleared from the leaves, and its sweet juice forced out by passing betwixt wooden rollers: in one mill there are commonly three rollers, placed perpendicularly, and turned by water, by wind, or by cattle. The juice is conveyed from the mill, along a trough or spout, into the boiling-house, either immediately into the boiler, or into a reservoir: it will scarcely keep above a night without fermenting and turning sour, or producing a portion of inflammable spirit, so as to be apt to take fire in the boiling, and endanger the whole building; hence the necessity of boiling it down into Sugar as fast as it is pressed out from the cane. This juice contains a large quantity of impurities, con-

but that for some purposes it answers better, as for chocolate and preserves; it is likewise esteemed more medicinal: considerable quantities are brought annually into Europe, particularly France, and there employed in disorders of the breast. It is reckoned that a pound of common Sugar goes as far in sweetening as two pounds of maple Sugar.

The large maples, commonly called sycamore-trees, bleed also in Europe a sweet juice, from which an actual Sugar has been prepared. In the Transactions above-mentioned for the year 1754, there is an account of some experiments made in this view upon the Swedish maple: eight trees, none of them under thirty years, bled in four days fourteen gallons of juice, which inspissated gave two pounds and a half of brown Sugar; another time, the same eight trees bled in three days ten gallons and a half, which yielded one pound four ounces of Sugar, with half a pound of syrup. It is the saccharine juice of the maple-tree which, exuding upon the leaves, renders them so apt to be preyed upon by insects.

The common birch bleeds also a large quantity of a sweetish juice, which yields, on being inspissated, a sweet, saline concrete, not however perfectly of the saccharine kind, but seeming to approach more to the nature of manna.

There are sundry other vegetables raised in our own country, which afford saccharine concretes, as beet-roots, skerrets, parsnips, potatoes, celery, red cabbage-stalks, the young shoots of Indian wheat; the Sugar is most readily obtained from these by making a tincture of the subject in rectified spirits of wine, which, when saturated by heat, will deposit the Sugar upon standing in the cold.

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sisting partly of a gross, unctuous, and herbaceous matter, separable by colature and by despumation during the boiling; and partly of an oily substance more intimately blended, so as to require for its separation certain additions, as alkaline lye, and more particularly lime-water; without these additions it never assumes the form of a concrete Salt or Sugar, yielding only a soft, unctuous extract, which cannot be reduced to perfect dryness without such a degree of fire as renders it fetid and empyreumatic. After the first boiling and despumation the juice is emptied into other coppers, a quantity of a lye made from wood-ashes, or from ashes and quick-lime added to it, and the coction and clarification continued. When towards the end of the inspissation it rises up, so as to be ready to run over the vessel, the addition of a little oil occasions it quickly to subside again. It is observable, that if oil or citron juice were added in the first boiling, the Sugar would never concrete, or part from its impurities: the Sugar thus obtained is far from being pure; it is the common brown Muscovado; this is further refined by dissolving it afresh, boiling with lime-water and lye, and clarifying with ox-blood *. The Sugar-refiners at Orleans in France, and in England,

* Refining of Sugar.] The author has here overlooked an essential part of the process: the Sugar dissolved in lime-water, clarified, and boiled down to a due consistence, is poured into a conical earthen mould, having a small aperture in its lower narrow part, stopped with a plug. When the Sugar has concreted into a mass, the liquid part is drained off by the aperture, and some fine clay, softened with water into a paste or batter, is spread upon the upper broad surface; the moisture of the clay, slowly imbibed by, and percolating through, the Sugar, carries down with it great part of the remains of the treacly matter. The clayed Sugars brought from America are made from the juice directly, without a second solution, the liquor being more carefully depurated in the boiling than when intended for brown Sugar.

Sugar-candy is a crystallization of Sugar, prepared either from the brown or the white: the perfect crystallization of Sugar is not to be effected like that of many other salts, by evaporating the liquor in which it is dissolved till a pellicle forms on the surface, and then setting it in a cold place, but by boiling down the solution till it is almost thick, before it is removed from the fire, and afterwards continuing a considerable heat till the crystallization is completed.

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England, use whites of eggs for the clarification, particularly in making the fine Sugar : by repetitions of this process the Sugar becomes purer, whiter, of a crystalline appearance, but proportionably less sweet. A syrupy matter separates in the purification, called, from its honey-like consistence, Melasses or Melazzo ; from this are produced, by fermentations, the common inflammable spirits, distinguished by the name of melasses spirits. In America, the scummings also, and other refuse parts of the juice, are fermented for vinous liquors and rum.

SUGAR appears to be a salt of the acid kind, saturated with earthy and oily matter, on which its sweetness depends ; hence the diminution of its sweetness in proportion to its purification, or the separation of the oil : distilled by a gradual fire, without addition, it yields on the pound about six ounces of acid spirit, and two scruples and a half, or a drachm, of empyreumatic oil ; gently roasted it acquires a reddish brown colour, and in this state is used for colouring vinous and spirituous liquors yellow. By fermentation it yields an excellent kind of wine, and, by a continuance of the process, vinegar.

WITH regard to mixture with different solutions and other liquors, it is perfectly neutral, making no alteration in those which by acids or alcalies would be precipitated or have their colours changed. It renders essential oils, balsams, resins, miscible with watery liquors ; Hoffman observes, that when added to milk, it prevents the separation of its oily or butyraceous part ; from this property he supposes the dietetic use of Sugar to be fattening, as it renders the unctuous or fat parts of the food miscible with the animal juices ; I have known, however, many people who used Sugar in abundance,

The Sugar is dissolved in lime-water, and when evaporated to a proper consistence, poured immediately into pans, in a stove or hot room, whose air is so hot as not to be supported by animals for any considerable time : the crystals congregate upon small sticks, which are placed across in the pans for that purpose.

and yet were lean. It dissolves in rectified spirit of wine by the assistance of heat, but is scarcely acted upon by that menstruum in the cold *.

MANY of the Indians employ Sugar instead of salt for preserving provisions, which it does effectually without communicating the insalutary qualities of salted meats: the Sugar may be washed out, inspissated, and used for the same purposes again. From this property it has been employed by surgeons as a balsamic and vulnerary.

N° XLIV.

An Ulcer in the Lungs, piercing through the Diaphragm into the Liver. By Dr. Edward Barry, Physician at Cork in Ireland.

AT the desire of Mr. Moore, surgeon to Colonel Grove's regiment, I visited one of his men, who had ten weeks before been seized with a peripneumony, attended with a pain in the lower part of his right side, that never was acute, but terminated in an abscess, and soon after broke: the pus which he expectorated when I saw him, was very fetid, and by lying on the opposite side was discharged in a greater quantity. His body was much emaciated by frequent colliquative dejections, attended with a perpetual nausea: as he thus appeared to be in the last stage of the distemper, it was in vain to propose any method of cure.

* Solubility in spirits.] Rectified spirit of wine dissolves, by a boiling heat, about one twelfth its weight of fine sugar; if the solution be suffered to stand for a few days in the cold, the Sugar gradually separates, and concretes into elegant crystals. On this principle depends the method of extracting Sugar from sweet vegetables by means of spirit of wine: water dissolves the saccharine parts of the subject more readily and more copiously than spirit does, but it keeps them permanently dissolved and intermixed with the gummy or other matter which it had extracted at the same time; whereas pure spirit deposits the Sugar, and keeps the resinous or oily principles dissolved.

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ABOUT a fortnight afterwards I was present at opening his body, with several other physicians and surgeons: we found a strong adhesion of his Lungs to the pleura, where he had a frequent pain, and to the Diaphragm. Examining into the purulent cavity which lay immediately under the surface of that adhering part, we found it continued through the Diaphragm about an inch deep into the gibbous part of the liver, which closely adhered to the Diaphragm: the length of this sinus was about six inches, and its diameter in the liver was about three, but more narrow in the Lungs; the rest of the lobe of the Lungs was intirely found.

Nº XLV.

An uncommon Tumour of the Breast. By Dr. Peter Paton.

A WOMAN about thirty-eight years old, and to appearance of a good habit of body, shewed me a tumour which had been three months in her left breast; it was to the touch as hard as a stone, painful, and red all round, and protuberant in the middle: the woman, notwithstanding the trouble of it, continued at her work, having the Tumour covered with a diachylon cum gummi plaster. By degrees the Tumour turned soft, and at length a small suppuration appeared on the most protuberant part. Six months after I first saw her, as she was reaping corn in the fields this suppurated part broke, and a large bag fell out at the orifice, which she immediately brought me. The ulcer in the Breast was cured in a little time by washing it morning and evening with brandy, and applying some ung. basilic.

THE bag that fell out of it was composed of several membranous coats, the external of which was white and opake, but the internal were all pellucid: on the surface of the most internal I observed two very small caruncles. The liquor contained in this cystis, to the quantity of seven or eight ounces, was clear and transparent like water, but a little fetid to the smell, and bitter to the taste.

Foreign Medical Literary Intelligence.

P A R I S.

IN the History of the Royal Academy of Sciences, just printed at Paris, vol. 1762, in 4to. is a curious paper on the Arterial Coats; of which we have the following account in the Journal des Sçavans for January 1763. Translated from the original French.

THE Arterial Coats are different concentrical folds forming a tube which is nearly cylindrical in its figure: these coats have not any such resemblance to one another as to confound their distinctions, which are preserved by their peculiar characteristics respectively; these give to each other a reciprocal assistance, and by different actions concur to promote the same general œconomy. M. de la Sone, in his excellent memoir, does not detain us with a long detail of the various notions and opinions concerning the numbers and characters of these Coats; he makes it to appear that the source of these dissenting opinions among authors arises from the different experiments which have been employed to confirm their sentiments, and from the diverse subjects which they have severally chosen for the objects of their researches. He at first thought with Dr. Monro, that when we speak of the Arterial Coats in general, we should not speak of the first covering which the arteries receive from the adjacent parts; because this Coat or Covering is only found in particular places, and for particular purposes, as where it is necessary to strengthen the Coat of an Artery against any violence to which its situation may expose it in one place more than in another, either from the increased impetus of the fluid on that part, or where it is necessary, for other reasons, to secure it by additional protection, &c. This covering, therefore, ought not to be ranked with those which essentially constitute the Arterial Coat.

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THE first Coat, and that which indisputably appertains to the Arteries, is a cellular web of peculiar texture, of which an exact knowledge may throw great light on many of the phænomena of animal œconomy. It is this Coat which Dr. de la Sone makes the principal object of his disquisition, in order to inform himself more fully concerning its composition. The Arteries he employed for his experiments were those of oxen; the only process he used to subject them the more fitly to his inquiries was, to boil them in water for some time, thereby to separate and cut them with the greater facility; having then pressed and wiped all the water perfectly from them, he could distinguish by their colour the vessels, the fleshy and the tendinous fibres: by taking off the different parts of these networks with a needle, he perceived visibly their intertexture, their admirable reticulation, and the cellular web which they form, or which they surround with their meshes. After having removed this cellular and filamentacious web, another fold appears, the nature of which has perplexed anatomists with various dissentions and opinions; some maintaining that it is tendinous, some will have it to be nervous, and others will not even allow of its existence, and insist upon its being only a part of the former Coat; there are others again who believe it to be interspersed with glands. However, it must be admitted that Dr. de la Sone has taken great pains to make an exact and scrupulously accurate inquiry into the nature of a part upon which there has been such a variety of different sentiments.

By an accurate dissection of the Arteries of an ox he finds, after removing the first Coat to a plate, which is of a very close frame, very compact, and extremely elastic, which cannot be opened or separated by any means into a net-work, this second covering to be a fair web or membranaceous ligamenture, serving as the basis and support to the former web.

THIS membrane, so apparent in the Arteries of oxen, is not conspicuous in those of men, and yet less in those of women; Dr. de la Sone has therefore always been disappointed, when he has sought for it in human subjects: "And the error of anatomists, whose sentiments are so discordant upon this point, does not proceed from their having too slightly regarded, but from their having very improperly, always, either considered as invariable and general, a Coat which is only particular to some parts; or else from their having flatly denied its existence in general, merely because it has not appeared in those parts which have been the subject of their inspection."

Dr. de la Sone believes, nay, says he is authorized to believe, that this Coat is fleshy and muscular. One may easily comprehend that an almost total discoloration would happen from its being put into boiling water; this Coat seems to receive so few blood-vessels, that it is not to be wondered at that the boiling water should extract that colour, which the small quantity of blood they contained could communicate to it. A new, and in some measure a decisive argument advanced by this celebrated academician arises from his having observed, in the dissection of a man who died of a consumption, that on minutely inspecting the body, in which the muscles were attenuated, and become as it were membranaceous, the second Arterial Coat (which is the principal subject of his paper) had also undergone the same degeneration, and yet the other Coats had not partook in any degree of this alteration.

THE second or muscular Coat lies over the last-mentioned. It is delicate and thin, of a close texture, and extremely elastic; it is divisible into many plates or folds, and seems to have great affinity and resemblance to the periosteum. Like that it may be divided into leaves; it is also like that extremely adherent to the parts in its vicinity; but the most striking instance of similitude is in the property which this membrane has of ossification

fication in consequence of an emphysema. It is not uncommon to find the Arteries in old subjects to be in some places punctually ossified. Dr. de la Sone is actually convinced, from a multitude of observations, that this mutation happens to the interior Coat alone: he has (for so this sensible and most excellent historian of the academy expresses himself) sometimes even surprized nature in this very operation; he hath found this membrane tumefied, inflated, become even almost cartilaginous, having already some ossified points or spots apparently commenced in its substance; in short, just in the same state as we find the periosteum, when it is disposed toward ossification. From all which Dr. de la Sone thinks it may be concluded, that as in the formation of the fœtus the periosteum is the principle of the bones, so the internal Coat is in like manner the germ and rudiment of the Arteries.

THE lights which this author throws upon the structure of the Arteries, are not like those ineffectual and fruitless discussions, in which we see with extreme concern men, in other respects the most deserving of admiration and eulogy, employed in disputing and wrangling with such exasperated vivacity and reciprocal enmity, as only tends to render them the derision of the vulgar and the humiliation of the wise. These inquiries have an immediate relationship to the animal œconomy, as they furnish us with a clear explication of interesting facts, and at the same time shew, by a distinct light, how medical attempts may be the most prudently directed.

THE observations and discussion of Dr. de la Sone upon the first Coat, and the diversity of appearances which it afforded in the different subjects he has examined, are very deserving of attention. In the larger animals this reticular web is composed of two parts; the one, which may be properly called the web, and the other degenerates into a sort of ligamentous fold; which last is not to be found in mankind, the web instead of it being thickened and strengthened by its
affinity

affinity to the muscular Coat; but in women this muscular Coat is always lax and of uniform pliancy.

ON comparing these observations one would conclude, that this Coat assisted and enabled the Arteries to resist the impetus with which the heart forces to dilate their capacities: this resistance is greater in the larger animals, less in men, and least of all in women. Women are observed in all their parts to be of a more relaxed, tender, and delicate texture, and are much exceeded by men in the toughness and compactness of their muscular fibres; for this we can now account with the greatest facility from the observations of Dr. de la Sone. The web of the first Coat of the Arteries being more lax, they derive therefrom also a less degree of spring and resistance; from whence it follows, that the parts through which they are distributed, and of which they constitute so large a share, become also more flaccid and yielding, and the blood is impelled through the veins in the different parts of the body with a less vigorous and energetic vivacity. We may therefore conclude that the transpiration will be less in women than in men; that their accretion of body in the time of juvenility is more prompt; and that when their growth is finished, they become subject to plethora and superabundance of blood, which urges itself to those parts that are the most susceptible of it, which may be productive of very strange consequences, if the uterus, whose vascular and spongy texture is very well known, does not absorb a part of it, which it again exonerates by the regular evacuations common to the sex.

THE use of the second Arterial Coat is by no means equivocal; for when placed beside fleshy substances, it should have their appearance and effects, and of course act as a muscle; "Nothing, in my opinion (says Dr. de la Sone) "more fully establishes and proves that function of the muscles to be exercised by the Arteries, than that fact which is "so frequently verified by hunters, who have very commonly
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observed,

“ observed, fallow deer, and other beasts of chace, have had
 “ the ventricles of the Heart torn by a gun-shot, and yet
 “ have not ceased to run with the same impetuosity as before
 “ they were wounded, for more than an hundred paces ere
 “ they have fallen. How can we conceive the continua-
 “ tion of a motion so violent and rapid, which is the case
 “ in the precipitate flight of such animals, unless the circula-
 “ tion be maintained? And how can it be maintained, if the
 “ Arteries act by simple resistance alone?”

“ THE smooth and polished surface of the third Coat fa-
 “ cilitates the liberty of circulation and the current of the
 “ blood.”

THESE three Coats then, in union, concur to promote the same general function by means and powers that seem to be very different from those of each other; and it appears that the arterial canal, which to a vulgar eye may look as if all alike indifferent, formless, and inorganical, is to the more penetrating intuition and scrutiny of an inquisitive anatomist an admirable structure, wisely disposed, and fully deserving of our utmost attention.

F L O R E N C E.

II. DELL' Acqua Marziale di Rio nell Isola dell' Elba e dell' Uso medesima in Medicina e Chirurgia, Trattato Storico-Fisico-Medico d'Alberto Giuseppe Buzzegoli, Fiorentino pubblico Professore di Medicina pratica e Filosofia, in Rio, &c. Firenze, appresso Andrea Bonducci.

AN Analysis of the Chalybeate or Martial Waters of Rio in the island of Elba, and a full account of their qualities, as medicinally used for the cure of various disorders, by Albert Joseph Buzzegoli, Professor of Physic and Philosophy in Rio. Printed at Florence.

III. LET-

III. LETTERA del Seg. Dottore Saverio Manetti, che può servire di Supplemento al suo Trattato sul l'Inoculazione del Vaiuolo, diretta al Dottore Giuseppe Angelo Cafagrande Cremonese, Medico Astante nel Regio Spedale di S. Maria Nuova. In Firenze, 1762, presso Andrea Bonducci, in 4to, pag. 52.

OR, A Letter by Dr. Saverio Manetti, intended as a supplement to his treatise upon the inoculation of the small-pox, addressed to Dr. Joseph Angelo Cafagrande of Cremona, physician to the royal hospital of S. Maria. To this letter is added one of Dr. Cafagrande to Dr. John Calvi, physician at Milan: in both of which many new and cogent proofs are advanced in favour of inoculation of the small-pox.

THUS, whilst this practice is losing ground in France, it is daily extending its credit in Italy; and although the great Astruc is collecting all the unfavourable instances of it he can, to banish it from this side the Alps, the Doctors Manetti and Cafagrande are endeavouring to conciliate for it a favourable reception on the other: and it now seems probable, that unless the surgeons will condescend to insert this disorder only under the direction of the physicians, who may perhaps think that they have a right to some authority, where the person to be infected ought to be duly prepared to receive the variolous seeds; the bad effects of temerity, negligence, or ignorance in some, the contempt or inability to order a previous disposition of constitution, or the baleful intentions of disseminating contagion in others, will soon all together conspire to explode the practice of inoculation, which, under proper restrictions, is incontestibly the means of saving the lives of millions of mankind, and alleviating the miseries attending one of the most loathsome, cruel, and fatal of all human maladies.

* * The Letter signed P. W. and a paper inclosed, are received, and shall be taken notice of. Our correspondent is desired to send the remainder of his treatise as soon as possible, that the whole, if approved, may appear in the present volume; and to entrust us with his name, which shall not be published without his consent.

†† The several papers recommended to us from other quarters will also have due attention paid to them as soon as convenient.



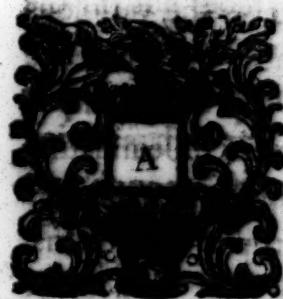
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N^o XLVII.

Conclusion of the Dissertation on the Hydrophobia.

[See p. 117. and 212—224.]

SECT. XXVI.



AS to the symptom common in the Hydrophobia beyond all others of a larger defluxion of saliva, it seems to prove, that in this disorder there is a much more copious congestion of humours towards the head; the reason of this may also appear to subsist in the union that is formed between the portio dura of the auditory nerve with the branches of the superior maxillary nerve, and from thence with the intercostal; for of the portio dura, which we shall only just mention, the middle twig particularly is conjoined to the superior maxillary nerve, and the inferior with the inferior maxillary nerve. The cause of this effect ought rather to be inquired after in the nerves of the pharynx, œsophagus, ven-

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tricle,

tricle, and abdominal plexuses, subservient to the purposes of digestion; for it is an observation common to vulgar experience, that a very copious flow of saliva, together with a great difficulty of deglutition, is frequently occasioned by medicines of an emetic quality, the stomach being thereby irritated to efforts of vomiting. Hypochondriacal people, who are frequently called spitters, hysterical women, and almost all those whose organs of digestion are easily excited by stimulants, universally suffer the same effect. In the Hydrophobia, therefore, it cannot seem very strange that the same thing should happen in a more copious degree, as the above-recited causes (§. XX. and XXII.) and symptoms evince: and moreover, we cannot deny that the saliva, contaminated with a most sharp hydrophobious miasmata, and being very apt to be excited by the least irritation, may not a little contribute to its preternatural flux in this disorder: from these causes, if they be augmented with the progress of the disorder, then it will easily be seen that this symptom will also be increased, and the nausea and vomiting will, with the vomit itself, be the consequence.

THESE symptoms of which we are now speaking indicate the first stage of the disorder, whilst, by general consent, the fever does not shew itself, which it frequently does not till the disorder has made some progress; an inflammation does not therefore appear to take place in this stage in the vessels of the vena portarum and its vicinity; if there be any inflammation in that quarter it is imperceptible, and as yet, though but small, there is beginning a stagnation of a subtiler acrid humour, which only affects the nerves, and contains the fomes of the future inflammation. Hence, in the first stage all the symptoms of the disorder are the more mild: before the fever begins to advance, the activity of this malignant matter is not yet driven by the circulation into all parts of the body, nor threatens as yet to induce that destruction of the more noble juices, which afterwards comes on; the blood, therefore, to all appearance is good; the pulse not much altered, but resembling

resembling that of a sound man, although, from the stricture of the nerves already begun, somewhat feeble or quick. From the stricture of the reins, whose nerves are connected by a remarkable juncture with the abdominal folds, the urine is become pallid, with a small yellowish tincture, nor is it voided without difficulty. This stage is longer or shorter of duration according to the different temperaments of the sick and the different degrees of activity in the venom: it may, as we have already said, continue for fourteen days, from the increased acrimony or quantity of the humour with which the containing vessel is irritated, in proportion to which are the symptoms thereby excited.

S E C T. XXVIII.

IN the second stage of the disorder all the symptoms of the first are heightened, and now that inflammation commences, which is almost always observed to appear on the dissection of the dead; hereby the tightness on the præcordia, anxiety, and difficulty of breathing are increased, more manifest convulsions are now apparent through all parts of the body, a more copious afflux of saliva is derived to the mouth, and slight constrictures of the throat begin, which, it is evident, may all arise from the increased tension of the nerves. But when the fever, the constant companion of an inflammation, has once spread itself to the more noble parts of the body, it then becomes obvious enough; increasing by degrees, as circumstances accelerate or retard its progress; at first slight rigors are caused by it, and those are quickly followed by slight burnings, and after these thirst, watchings, and other concomitant effects of a fever come on.

S E C T. XXIX.

AMONGST the other enumerated symptoms the priapism, together with an involuntary seminal emission, have not been omitted: this symptom may seem somewhat strange to many

people, and they may perhaps imagine that it is occasioned merely by the external application of blisters; but this is not a symptom peculiar to the Hydrophobia, but often happens in symptomatical epilepsies, convulsions from worms, and other disorders in which the intercostal nerves are equally affected; this symptom, therefore, is soon investigated, if we pay due attention to the course of the intercostal nerve; for not only the posterior trunk of this nerve, but likewise the renal plexus, and the hypogastric, all send various branches to the ureters, the spermatic chord, bladder, and genitals, to all which any irritation that happens in the præcordia may be derived, and there produce the above-mentioned phenomena*.

S E C T. XXX.

OBSTRUCTED deglutition of liquids, together with the greatest horror and aversion at the sight of them, is the most remarkable symptom attending the second stage of this disorder. Various are the opinions of different men concerning

* By inversion of reasoning, therefore, if a stimulus happens in the genitals by consent in the branches of the intercostal nerve sent into those distant parts, so we learn from various observations, that spasms in the head and neck are the consequences. What Schenckius says (*Obs. Med. lib. vi. p. m. 508.*) to this effect is very worthy of notice; "A surgeon, observing something like a white thread to adhere, in an ulcer of the penis, towards the right side, laid hold upon it to draw it away, on which immediately the head and neck of the patient were drawn towards the right side in the same direction as the thread, and so it remained for eight or nine months." Again, a person having a suppression of urine, a silver pipe was forced into the urethra with such violence that blood followed it, by which immediately the neck was convulsed with great pain, the hearing taken away, and the temples forced as if some compression was applied thereon. Also a man having a suppression of urine, caused by caruncles in the urethra, was thereby afflicted with a violent pain in the forehead; the suppression being relieved, the pain also instantly vanished. Again, a person of some d. function, who was afflicted with a scabies, had excessive pains about the præpuce, from whence the violent itching in his hands was derived; that was the sole reason of this immoderate itching, and though not the whole, but the greater part of the same became gangrenous, and soon after sphacelated, when he was instantly afflicted with deafness, and had such pricking pains in the fauces that he could eat nothing.

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the origin of this symptom; some believing it to arise from the imagination's presenting the representation of the dog and other strange appearances in the face of the water to the mind of the person afflicted *. But although this may have been the case in some particular instances, yet several who have been troubled with this disorder, and were still capable of giving a rational answer, have said that they saw no such fantastical resemblances in the water: others have said that this symptom was occasioned by the inflammation of the fauces, and the squinzy accompanying it; but this is not always a consequence of this disorder, although it has sometimes appeared upon dissection that the fauces have been inflamed. On the other hand we are taught, by inspection of the throats of other subjects, living and dead, that there is scarcely ever any inflammation in those parts, as (ex. gr.) in a squinzy, but the sick can always take liquids, though he cannot swallow the least morsel of solid food: which is reversed in the Hydrophobia. The following phenomena, which always arise upon every attempt to swallow liquids, deserve attention: "Some," after they have recovered from the convulsive paroxysms, "have said that they were parched and burnt with excessive desire of drink, yet scarce had they touched it with the tip of their tongues, but they were instantly seized with the most terrible stricture of the jaws, cruel heart-burnings and tortures, together with extremely acute pains of the head, and particularly of the eyes, followed by universal convulsions of the whole body, by which they were totally deprived of sense †." All these, joined to the confusion of the sick themselves, sufficiently shew that neither any inflammation of the fauces, nor any fantastical resemblances imaged in the water, although they may sometimes accompany, can be the proximate cause of this symptom, but that this spasmodic stricture of the jaws, with the aversion of liquids,

* Jod. Lommius Obs. Med. p. n. 71.

† Schrader Fascic. Obs. rar. p. 50.

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is solely occasioned by the effect of the disorder upon the intercostal trunk, as before-mentioned. The same phenomena, but in a milder degree, and without the fervent desire of drink, is not very uncommon to hysterical women, who, though they have neither any such inflammation of the fauces, nor are terrified with the imagination of any canine resemblance in the fluid, yet they cannot swallow a drop of it.

SECT. XXXI.

THAT this symptom may be more perfectly explained, and its cause more fully comprehended, another concomitant circumstance of the Hydrophobia must not be omitted; namely, that almost all Hydrophobics, as well those who have contracted the disorder by the bite of mad animals, as those who are afflicted with it spontaneously, have perceived a most exquisite irritability of the whole body through the nervous system; they can scarcely bear the breathing of the gentlest motion of the air, the least glimpse of light offends, and sounds hurt them. This singular constitution of the body is perfectly confirmed and corroborated by what we have already mentioned (§ XX. and XXII.) concerning the contagious Hydrophobia and the proximate causes of that symptom; namely, subtile, acrid, oleose particles which not only injure the nerves with their stimulating poison, and mix it with the nervous fluid, but also affect the liver, and corrupt the bile; therefore, so often, we have repeated that the intercostal nerves, or par vagum, are the principal ones affected in this disorder. The distribution and communication of these nerves being so extensively branched with all the nerves of the head, and the greatest part of the spinal marrow, as we have briefly and anatomically shewed, it is not difficult to conceive how they become affected preternaturally or painfully, and how matter so malignant may be propagated through the whole body, and the rest of the nerves thereby suffer such an irritation, that the most gentle undulation of external objects, as the air and
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the light, as is above noted, or the contact of liquids, though approaching with the most tender delicacy, shall excite an idea of pain. The like may be observed in those fevers which the ancients called phricodes, in which the patient trembled and shivered at the least breath of air. The like frequently happens in various exanthematous and other malignant fevers, in which a subtile alkaline acrimony predominates, or where the præcordia are oppressed with putrid juices: so likewise those who are subject to the hæmorrhoids, or at least have a tendency that way, perceive from the least cold shivering horrors from the head down all the spine, and then diffused through the whole body. The like is also observable in hypochondriac men and hysterical women, and almost all the tribe of disorders in which the nerves of the præcordia suffer a preternatural irritation, or the patients are inclined to convulsive spasms; they frequently shiver and quake, and, what is equally worthy to be noted, they are, as we have often observed, struck with the greatest terror by the slightest accidents. But it is well known how much the nerves may be affected even by the smallest causes, as is instanced in the otalgia, in which the softest sound, and in the ophthalmia, in which the faintest glimpse of light, and even those objects which recreate a well eye to behold, excite the most exquisite pains.

NOT to insist upon many other things, we shall only observe that the distension of the ventricle, the cardialgia, cholics, convulsions of the whole body, with a violent expulsion of the fæces or urine, may all be easily accounted for from the same principle as they are derived from the same origin. When, therefore, the sick have an impediment in swallowing liquids from the irritation above-mentioned, this must happen from the constricture of the fauces which we have already noted, which increasing by irritation, acute pains in the eyes and ears will follow from the vicinity in their actions, and their branches being alike derived from the intercostal nerve. Besides, the desire of drink, as we have mentioned, may be placed as one
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of the incipient criteria of this distemper, doubtless arising from the same stricture of the fauces and the subjacent parts; and thence, from the want of saliva (though flowing at the same time in extraordinary abundance) a dryness is caused, which hinders the deglutition; but those various and febrile inflammations which come on in this, are not unfrequent in other disorders, occasioned by an hot intemperature of the body. It may be more difficult to shew how it comes to pass, that the patients in this distemper do not with equal obstinacy refuse solid foods, unless, perhaps, this may happen from the more irritating keenness of contact caused by liquids against the sides of the mouth, the tongue, and fauces, and thereby occasioning these greater strictures, which do not happen from the contact of solid foods; or there may be a force in solids superior to the strictures of the fauces, or at least their weight may enable them to descend against the opposition of those obstructions. Frequent and careful observations of these extraordinary cases have at length made me somewhat more certain with regard to another cause which may be at the bottom of these abstruse matters. But since in this disorder several and the like inflammations arise as in fevers, it seems evidently to admit of the same causes, as they usually happen in other diseases in which there is a very fervent heat. It is more difficult to decide why these patients do not refuse with the same aversion solid meats; though the reason of this may perhaps lie in that the liquids penetrate the sides of the mouth, the tongue, and the throat much more, and produce therewith a greater irritation and commotion than the solid food can have upon these parts; or it lies, perhaps, in the heaviness of the meat itself, which makes it go easier through the strictures of the throat, or at least to slip down, notwithstanding their resistance. If there are, perhaps, other secret causes of those things, a more exact and frequent observation will be able to discover the same in those singular cases; however, it cannot be asserted that the deglutition of

solids is performed intirely without being affected; for a trembling of the hand, terror of being hurt therewith, and a sort of snatching in their action, similar to the rapacity of a dog, shew plainly enough that they have a sensation of stricture and difficulty in swallowing.

It is likewise to be observed, that they cannot eat solid food during the whole course of the disorder; but that when it is arrived at its highest stage, then they become even deprived of that faculty; which proves pretty clearly that the causes of these symptoms are such as we have just now mentioned, or at least that this is the unavoidable consequence of an inflammation which has already seized upon the internal parts. However we do not deny, but that some of the symptoms enumerated in this and the foregoing section ought, especially in some of the cases above-recited, to be attributed to the perturbations of a disordered mind and vitiated imagination in the patient; for the nature, and particularly the progress of this disorder, plainly demonstrates that the mind, at times, especially during the paroxysm, will not be exempt from those perturbations. The same appears from the flushing in the face, the fixation and inversion of the eyes, and several other circumstances; but that it cannot be otherwise, is apparent from the violent impetus and increased afflux of liquid humours towards the head (§ XXIV.) as well as the extreme irritation of the more capital nerves; for it is well known that the head will in some measure be disturbed even by causes of a much milder kind, than when either a preternatural accumulation of humours is derived that way, or the more noble nerves are too much irritated, as is frequently the case in acute and ardent fevers, in hypochondriacal as well as hysteric affections, in symptomatic epilepsies, and many other disorders.

SECT. XXXII.

THIS delirium has again its various degrees: some patients seem to retain their senses very well, others are a little disordered in mind, and others again are quite raging mad; when, therefore (as frequently appears from these kind of histories) some preserve their lucid intervals, and some do not, this difference must be attributed to some peculiar disposition of body or diversity of constitution, as the patients are more or less inclined to an humid or an hot temperature; therefore the celebrated Sauvage has observed, that commonly men are more violently affected than women. Hence it is, that when these patients bark and yell, or are inclined to bite, even like dogs, those depravities should not be merely ascribed to the power of a canine imagination. Often indeed, though vehemently disordered, the sick do neither bite, nor are mad in any great degree *. And Choisel has observed, even in the hottest parts of India, a multitude of cases of the Hydrophobia in which none of the patients imitated the animal by which they were infected.

THESE sudden barkings, so frequent to these patients, may be ascribed to that continual and heavy oppression of the breast, as well as to the stricture of throat with which they are always affected; under which afflictions the patient is not able to articulate distinct sounds, but only such as are confused and interrupted, which sometimes nearly resemble the yelling and sometimes the barking of a dog; hence they appear to have the strongest efforts of the fauces and the breast during those sounds, gapings, and shortness of breath, which cause them, whenever they offer to speak, to utter only interrupted and broken syllables †. But a desire of biting, if it really be the case, or even if they should sometimes bite,

* See Zwinger. Hist. Hydroph. in Misc. Curios. dec. iii. 2. 2. obs. 104.

† Idem ibid.

doth not always proceed from an inclination to do mischief, as is proved by the confession of the greatest part of the patients themselves, who assure us that they find themselves constrained to it involuntarily, and therefore they admonish those who are present not to come near them. The reason of this phenomenon appears therefore to lie mostly in the body, and in a preternatural disposition of its nerves, and, perhaps, even in the irritation and stricture of the fauces, proceeding from the præcordia, which, when propelled towards the head, affects also the sub-maxillary muscles. Certain it is that the same phenomenon has been observed in disorders occasioned by worms, when the nerves of the intestines have been irritated therewith*: nor is it uncommon for children who are troubled with vermin to gnash their teeth during sleep, and to scratch their noses, which itch very much; so likewise those who are subject to the hæmorrhoids are sometimes subject to nearly the same inconveniences.

S E C T. XXXIII.

WITH those symptoms, as they are described from section XXVI. to XXXI. the patients are for several days afflicted, as mentioned above, the principal of which is the constant aversion to all sorts of liquids; and by that means the necessary accessions of fluids being denied to the body, the effects of the distemper must inevitably be increased; so as by this constant fever and continual abstinence from liquids, it follows necessarily that the blood must be more and more deprived, not only of those mild and diluting recrements, but must, thereby, be rendered much sharper: and this is the cause why, in the advancement of the disorder, a new scene appears full of the most fatal symptoms; for then the thirst increases to a higher degree, the tongue grows quite dry, the voice hoarse, the urine lixivious, and the patient so furious, as to be necessarily

* See Fabricius Diff. de miris quibusd. Moribus convulsivis. Helmst. 1751. p. 12.

confined down by force. It is easy to perceive that such phenomena are the prognostics of an inflammation of the internal and more noble parts; it is therefore in this stage of the disorder that those inflammations arise, of which the signs are found in the intestines, ventricle, &c. upon the dissection of the dead; for those inflammations do not always attend; at least in a perceptible manner, the second stage of this distemper, as appears from the fever being much lower and the other symptoms more mild. However, since oftentimes no signs of inflammation are found in the principal parts, even when the dread of water has been for a long while upon the patient, it appears again that such inflammations are not always the necessary causes of those various convulsive spasms which attend the Hydrophobia; but when once they are begun, they must of course produce the most fatal symptoms; for as of themselves alone they frequently prove grievous, and often mortal, it must follow that they will excite worse effects when joined to such a dangerous inflammation of the liver, as, according to what we have shewn above, happens in this case. It is therefore obvious that these inflammations are not to be deemed the efficient causes of the distemper, but rather symptoms attending the last stage of the disorder: they are usually mortal, and when they have produced a gangrene, and death is at hand, then failure of pulse, coldness in the extremities, chilly sweats, oppression and labour in respiration from the preternatural quantity of blood accumulated upon the breast, are all indications of the commencement of that fatal period.

SECT. XXXIV.

WE might now proceed to give reasons for the many other phenomena which appear in dissecting the bodies of hydrophobous subjects; but it would be too tedious, since these matters are better explained in the very histories themselves of such cases, or may be remarked on inspection: but one circumstance we cannot pretermitt, it is this, that after the de-

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cease the carcase still, for a long time, retains a small degree of warmth, and presently putrefies; which not only shews the extreme malignity of the distemper, but may also abundantly evince its putrescent quality, and likewise confirms the propriety and exactitude of the explication we have given of its causes; for in malignant and putrid fevers such black and livid spots (which for the most part either precede or indicate a gangrene) frequently appear, as generally shew the bodies of the dead to contain qualities similar to that we have just mentioned.

SECT. XXXV.

WE might now finish our general explanation of the Hydrophobia, and proceed to our last part, if one doubt did not remain, which may still require further consideration, though it be in some measure already discussed in section XX. & seq. For it may be objected, that there may be inflammations of the liver, and yet no Hydrophobia. This assertion might seem to have some weight in it, if appearances are but slightly attended; but when we speak of inflammations of the liver, not only the particular part they occupy, but likewise the vessels which are inflamed, and even the diseased parts themselves, and the irritation of the nerves thence occasioned, should be well considered. We have said enough concerning the situation, the matter, and force of this disorder; with regard to the vessels, it is known that there are many different sorts of vessels in the liver; therefore, as a disorder invades one or other of these vessels, so the effects or symptoms vary accordingly, though they may not altogether relate to those already mentioned. If, therefore, the hepatic arteries, as well its own as those that are brought from the neighbouring parts, particularly from the right diaphragm, not to mention the capsulæ Glissonii, are inflamed, certainly other effects must arise than if the venæ portæ are affected: however, not only inflammations happening in the hepatic arteries cause some symptoms similar to those of the Hydrophobia, as we have already

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mentioned (§ XXI.); but the ancients, Hippocrates *, Arræzus †, and Trallianus ‡, have remarked, that in fevers where the liver is inflamed, and in those malignant epidemical disorders, formerly called phrenitides and paraphrenitides (raging fevers) that then the patients become brachypotic, or they drink but little, and that hastily, and in drinking perceive spasms which excite a horror to liquids; from whence a celebrated modern writer thinks, as the ancients did before him, this symptom of those fevers so striking, that he pronounces it to have the greatest affinity with the Hydrophobia, because of the difficulty of swallowing liquids. If, therefore, a difficulty of drinking is observed to be caused by diseases of the liver, although less violent in their effects, because of a milder nature, much more reasonably may we suppose in the Hydrophobia, that the liver being affected may, under the above-mentioned circumstances, be the cause of those symptoms; why, therefore, in the Hydrophobia this symptom and others are much more violent than in malignant fevers, must be attributed to a more fierce and sharp exasperating cause in that than in these; for this cause varies greatly according to the bodies it acts upon and in proportion to their re-action, as will appear more largely from what we already have mentioned.

Of the particular Hydrophobia caused by eating of Beech-nuts.

SECT. I.

THE first section containing nothing more than a description of the Beech-tree, as it is a plant generally known, we will not trouble our readers with repeating it.

* Coac. lib. cxxxix.

† De Cur. Acut. lib. i. § 11.

‡ Lib. i. c. 15.

SECT. II.

THESE nuts, on account of their plenty and oily nature, are chiefly used by the country people for the fattening of swine; and it is observed that the pork which is thus fed, is more tender and delicious than any other sort: they are likewise a very agreeable food to many other animals, particularly to mice, squirrels, thrushes, blackbirds, and other animals, as Matthioli informs us *. Even men sometimes use them, though not for food, as formerly in Caio, yet frequently as a delicacy. It is a custom in some parts of Silesia amongst the poor people, as Shwenckfeld informs us †, to express an oil from them, which they use instead of butter. The kernel is sometimes medicinally used, mixed up as an ointment, and applied to the loins to alleviate nephritic pains ‡.

SECT. III.

IT appears therefore from the above section, that this fruit is not only a very agreeable food to brutes, but also to mankind; and therefore we should the less expect any bad effects or disorders to be caused by it; but that it ought not to be intirely unsuspected, will appear from the following remarks.

JOHN BAUHIN || writes of this kind of fruit; " We have
" observed that the Beech-nuts, chiefly when fresh gathered,
" and before dry, will disorder the head like daniel, if eaten
" too copiously; and it is said that even hogs grow stupid
" and drowsy by feeding upon them. Ray § observes the

* Comment. on Dioscorid. p. 205. edit. Valgrin 1565.

† Cat. Stirp. & Fossil. Siles. p. 71.

‡ See Tragus Hist. Stirp. p. 1108.

|| See Hist. Plant. tom. i. p. ii. p. 122.

§ Hist. of Plants, tom. ii. p. 1382.

same thing from J. Bauhin; and Mangetus * does the same. Gottshedius † declares, "That country people are intoxicated" and rendered giddy by eating largely thereof:" however he attributes to their sweet kernels a very diuretic property; in which he agrees with Dodonæus ‡, who commends the use of them in mitigating pains from the stone, and for provoking the expulsion of gravel from the urinary passages. But his opinion that Beech-nuts were of the same nature as those of the pine, has been refuted by John Bauhin, and afterwards by himself relinquished. Shwenckfeld § testifies likewise that this fruit affects the head, and inebriates those who eat thereof too plentifully. A further suspicion of a noxious quality in these nuts is excited by Sim. Paullis §, who says that they are the food of swine, not of the human race, by whom, if through necessity they be eaten, they cause head-achs. Haller ** declares this fruit to be delicious indeed, but not altogether wholesome, and quotes not only the Transactions (Act. Haffn. ann. ii. obs. 57.) that the ardent fevers, called leipera or caufus, have been occasioned by eating thereof, but mentions from those of Breslaw (Act. Phys. Med. Nat. vol. viii.) that they are even pernicious to some brutes, causing by their acrimony diarrhœas even in swine, unless they be given mixed with acorns. To all this we can add our own experience, if that were of any moment, that the eating thereof has frequently caused head-achs and swelling of the mouth. From these inductions it appears that the fruit is possessed of a stupefactive quality, offensive to the nerves and animal œconomy: there are examples where it has caused very

* Biblioth. Pharm. tom. i. p. 910.

† Flor. Prussic. p. 72.

‡ Stirp. Hist. Pempt. p. 833.

§ Catal. Plant. cit.

§ Quadripart. Botan. cl. ii. p. n. 68.

** Enumer. Stirp. Helv. p. 161.

terrible

terrible and fatal disorders. An observation of Furstenu * makes this indisputable; " A lad of twelve years, in high " spirits and full bloom of health, in November 1744, as he " was walking very calmly in the open air, was seized with " a pleurisy, soon became delirious, and died in convulsions " on the eleventh day:" upon inquiry into the cause of this disorder, which was not at that time any where else in that neighbourhood, he learned that the boy, besides an immoderate use of other trash, had eaten a great deal of the Beech-mast, which, when fresh gathered, had been given to him by the country people; upon which occasion it was then related, that some years ago, about forty, the inhabitants of a village were attacked with a mortal pleurisy, which was by the clergyman of the place ascribed to their immoderate use of Beechnuts.

S E C T. IV.

SINCE, therefore, experience proves that these nuts are far from being innocent, and rather very suspicious, it cannot be thought strange, that in this our present case a most dreadful disorder may have arisen from a plentiful eating of this fruit; but by previously roasting them upon the furnace, as the patient had done, he might undoubtedly have heightened their pernicious quality; for it is well known from chymical experiments, that all oily substances become acrid and corrosive by being exposed to a very gentle heat; how much more will they be rendered fierce and empyreumatic by exposure to a more violent heat? for every oily substance contains, besides its phlogistic, inflammable, terrestrous, and aquatic part, a salt, which by the action of fire will commonly be carried off and freed from the body in which it adhered, which is by that avoilation rendered more subtil: and it is very likely that even the particles of fire, applied outwardly, may adhere to the oleous parts, and convert the whole, which was before mild,

* Aët. Phys. Med. Nat. Cur. vol. viii.

to an acrid and violent nature. What the fire does here by unsheathing the saline spiculæ of their oil, will likewise happen from their being kept till very old; wherefore the mildest oleaginous bodies, when kept to be very old, become rancid, and acquire a preternatural acrimony, as is easily perceived by their offensive smell and disagreeable taste.

S E C T. V.

IF, therefore, the kernels of Beech-nuts of themselves, because of their stupefying quality, are already so pernicious to the nerves and animal œconomy (§ II.) beyond dispute that natural property imprudently heightened by fire in roasting them, and plentiful eating, might have been greatly augmented. This subtle acrimony, in the case we have related, might have had a greater effect, and excited in the nervous system those violent strictures, spasms, and other symptoms from thence arising, in greater proportion as the patient had eaten more plentifully than usual thereof, which, with other concurring causes, might have flung a larger quantity of this subtle acrid oil into the mass of fluids. But which of the viscera might have been thereby offended, and how it came to pass that particularly the Hydrophobia should be the consequence, we will attempt to explain with all possible brevity.

S E C T. VI.

IT may appear, and particularly from the writings of those who make the inflammation of the fauces a principal characteristic of the Hydrophobia, that if this fruit be so plentifully eaten, the throat may be soon inflamed by its acrimony; and, doubtless, this acrid oil will exert some power, not only in the parts appointed for deglutition, as the pharynx, œsophagus, and adjoining larynx, but likewise, when descended into the ventricle, and coming in contact with its folds, those more inward parts may thereby be affected. But how this action can so suddenly become so great, that an inflammation shall

shall arise in those parts, and what is more extraordinary and worse, even produce the Hydrophobia itself, I must confess is an object of doubt: the organs of deglutition may indeed be so much irritated and contracted, that the necessary afflux of saliva being denied them, thirst and dryness in the subjacent parts, and even dread of water, may happen. (§ II. XX. XXVI. &c.) But an inflammation in those parts is not an early symptom, as fully appears by the patient being able for some time to swallow bread: furthermore it may be observed, that the parts principally subject to this irritation are the mouths of the vessels there dispersed, but particularly those of the trunk of the par vagum, which extend through all that quarter, and spread themselves to the ganglia semilunaria and the plexus hepaticus. (§ II. and XVII.) It is further to be remembered; that only the most violent poisons, when dissolved already, or when they are of a very soluble quality, are capable of affecting with vehemency the superior organs of deglutition. Lastly, we learn from physiological disquisitions that the particles of food, or what has been swallowed down, are by mastication so mingled with saliva, that they become attenuated and separated in the stomach; but it is at last in the duodenum perfectly digested and mixed with the alimentary juices of the human body: it plainly from hence appears that the acrimony of this fruit has attained to its highest degree in power, when it passes from the ventricle to the duodenum; thence it sharply stimulates the nerves we have mentioned, and ganglia semilunaria, and affects the bile thereby contaminated, as appears by the consequent green, putrid vomitings. From hence putrid and corrosive fluids being generated, and passing thence by the bibulous veins and small branches of the venæ portæ, are afterwards forced back into the liver, where they rage with exasperated violence, stimulating the hepatic nerves, and causing in the remotest branches of the venæ portæ a stagnation of acrid humours, with the other effects above demonstrated (§ II. and XX.)

SECT. VII.

FROM what we have said (§ II.) it is easily to be explained how the Hydrophobia may arise from these disorders in the liver; but we should transgress the limits of our dissertation, should we be more circumstantial in investigating the symptoms and phenomena already related in the history of this distemper, as they may readily be comprehended by every one who will take the trouble to consider it with due attention. A wide field still opens before us, were we to take the occasion to treat of the various methods and remedies more or less efficacious, and from time to time employed against this terrible malady; but it is obvious to every body that this cannot be fully accomplished in a few words; it were therefore more proper to reserve this subject for a future opportunity, than to treat in an imperfect manner a subject of so much importance. We intreat the benevolent reader to look with candour upon whatever we have said that may not intirely agree with his sentiments, or to join with us in what he thinks we have delivered with propriety.

N° XLVIII.

Trepanning recommended in Apoplexies from inward Causes, and in other obstinate Diseases of the Head.
By Dr. Flemyng.

I Do not remember to have seen in any practical book the operation of Trepanning directed for the cure of Apoplexy from inward causes, or of any other internal disease of the Head; nor have I ever known it practised in such cases: this might indeed have escaped my small reading and experience; but even the indefatigable Boerhaave, in his chapter on Apoplexy, which he valued himself upon, as one of the most accurate

curate in his book, amongst the many remedies for that Herculean distemper collected from all the authors he had read, makes no mention of Trepanning. Heister says the ancients used it not only in external distempers of the scull, but likewise in inward head cases of the more obstinate kind, which could not be cured by medicines, nor issues in the coronal suture, but quotes no particular author*; so that this practice, if ever it was in use, is now obsolete; and if it be a reasonable and just one, ought to be revived.

I AM apt to believe that the reason why this operation was not extended to all the purposes for which it might be serviceable, hath been an imperfect consideration of its nature and effects: it hath been viewed chiefly in the light of an issue to give vent to humours, or as a door opened to let out pus or extravasated blood, and to give access for raising a depressed part of the scull, or removing a troublesome splinter. Another effect, scarce less important than any of these, to wit, its taking off at the place of perforation a resistance or counter-pressure from the brain and its membranes, has been overlooked, or at least not sufficiently attended to. The different bones which form the cranium by their gradual ossification limit the growth of the brain, and mould its figure; when their hardness is uniformly completed, they resist the force of the pulsation of the arteries within, which must be considerable, since the larger ones of the dura mater make furrows or grooves in the inner table of the scull. The head is always full, even in the last stage of the most lingering consumption, when the other parts of the body are almost wasted to nothing; and the heart continues at every pulse to throw a considerable quantity of blood into the brain with no small force. When the dura mater is laid bare, its rising and fall-

* Chirurg. capite de Trepannatione. N. B. I have since found, and mentioned in my Physiology, p. 177, that this operation was practised by Aretæus in inveterate epilepsies with success. See lib. i. de Morbis diuturnis, cap. 4.

ing at each systole and diastole of the heart is very conspicuous; and when both it and the pia mater are broke, considerable portions of the cortical part of the brain are protruded through the wound: from all which it plainly appears that the scull sustains a considerable pressure from the brain, and by its re-action presses upon it.

IF, therefore, a solid piece of the scull of a remarkable breadth is cut out, the resistance arising from the bone in that part is taken off, and only that of the membranes left; which must needs be more flexible, and more easy to be protruded outwards, than when supported by the bone, unless the dura mater itself is ossified at that very place, which is a rare case, and therefore greater freedom will be allowed to all the cranium. Let us apply this reasoning to violent and obstinate diseases of the Head arising from inward causes, that is, not brought on by external violence, as wounds, blows, or falls; and first to apoplexy.

ALL apoplexies arising from causes within the cranium (for some come from poisons acting in the stomach) are produced either by a plenitude or dilatation of vessels, without breach or perfect obstruction, which I believe is very seldom the case, but here mention it as the general doctrine of authors, that nothing material may be omitted; or by extravasation of juices from ruptured vessels, whether changed or unchanged, blood, or purulent matter; or by accumulation of fluids in dilatable cavities, as of serum or lymph in the ventricles of the brain, without any breach; or lastly, by solid tumour and increased bulk, as polypuses, scirrhuses, or bony excrescences. The ultimate effect of all these is incroaching on or diminishing the space possessed by the brain in a sound state, and so pressing upon the sensorium commune, or, as that acute and learned, as well as diligent inquirer into the animal œconomy Dr. Lun, chooses rather to call it, the aistheterion, and thereby hindering or perverting its functions.

SINCE

SINCE then the immediate cause of apoplexy is pressure on this source of nervous filaments, the general indication of cure is to remove that pressure, and procure it freedom: from what hath been said it is evident, that Trepanning hath such a tendency, and that in an eminent degree; and therefore in obstinate apoplectic cases, where the means in common practice are of no effect, it may reasonably be tried.

IF the operation is judged expedient, I should think the largest size of trepan heads the properest to be used; the broader the piece cut out, the more resistance will be taken off the brain and its membranes: I should think that corner of either of the parietal bones, near the bregma, or the meeting of the coronal and sagittal future, as proper a place to operate in as any, the bone being there of a pretty equal thickness, and rather flatter and less convex, at least generally, than elsewhere; and therefore the more likely, when the piece is cut out, to allow the dura mater to be protruded outwards by the impulse within, and so increase the volume and liberty of the brain and its appendages.

THOSE that are acquainted with the animal oeconomy, and have seen practice, well know of how great consequence it is to remove a very small degree of pressure from the contents of the skull: the taking out of a few drops of extravasated blood or pus hath often perfectly restored the principal functions, which before were almost totally sunk and overwhelmed; and therefore the smallness of the freedom gained this way is no valid objection against the measure; nor is the dubiousness of success, or the dangerous nature of the operation itself, a just argument against it, since the cases in which it is here urged are supposed to be so obstinate and desperate, as not to yield to the means generally used. Thus much for apoplexy.

THERE are besides other internal diseases of the Head in which I think Trepanning might be of service, when scarce
any

any other methods can: I shall only mention a few of the most grievous, because it is hardly probable that it will either be advised by the physician, or submitted to by the patient, in those of the slighter and less dangerous kind.

I SHALL begin with habitual and inveterate epilepsies *: this distemper, when it continues very long, too oft impairs the animal faculties, and preys upon every thing that can render life worth possessing, and besides is attended with extreme danger, if not from its own nature, yet from its consequences, as the unhappy sufferers in these fits are liable to fall into fire, into water, down steep places, or upon hurtful objects; and therefore it may sometimes be thought prudent, both by the patient and his friends, that the operation of Trepanning should be advised, after all other feasible remedies that could be thought on have been applied in vain.

TEDIOUS and obstinate madneses, fatuity, idiotism, whether natural † or proceeding from distemper; blindness in both eyes, arising from what physicians call gutta serena; violent palsies, especially such as affect both sides, may be added to the list; not to mention violent racking pains in the head, obstinate vertigoes, and other fore-runners of fatal apoplexy. In such cases it may not be amiss for physicians to think on Trepanning, which, if they be judicious and prudent, they will not propose with too great confidence and in a magisterial way, but candidly warn the parties of the danger and uncertain issue of the operation.

THERE may be, before we conclude this article, reason to lay before the reader the following additional considerations, to wit, that though Trepanning should be allowed to have

* See the Note in p. 301.

† Natural idiotism would not have been here mentioned, had not the author's experience warranted the measure.

no other salutary effects in the distempers above specified than barely as an issue, yet it must be acknowledged to be the most powerful of all issues. Before the scull can be laid bare, a crucial incision must be made on the integuments, and their divided corners reflected upwards; from so large a surface of wound in the course of digestion there must be a considerable discharge; when the piece of scull is cut out, the vessels of the bone, and especially its medullary part, called diploe, will contribute their share of the flux, the wound will be long a healing; mean time the regimen of diet must necessarily be so very cool and thin, as to create the least shock upon the brain possible. From all which considerations the intelligent reader will easily perceive that great relief may reasonably be expected from Trepanning in most of the obstinate and Herculean diseases of the Head, the immediate causes of which are always plenitude or obstruction, or both, in some shape or other.

Nº XLIX.

The Diagnostics or Signs of the SCURVY. By Dr. Lind.

IN order to observe greater accuracy in the description of a disease attended with so many and various symptoms, these might have been properly enough ranged under three classes.

THE first containing the most common and constant symptoms, such as may be said to be essential to the nature of the malady.

THE second, such as are more casual and accidental, proceeding not so much from the genius of the distemper as from the epidemical constitution of the air, the state or habit of the body at the time, or from the determination of other causes. (See Med. Museum, vol. I. p. 51 & seq.)

AND the third, some extraordinary and uncommon symptoms that sometimes, though but seldom, have happened in it, and which occur only in the highest and most virulent state of this disease, from the peculiar idiosyncrasy of the patient, its combination with other malignant diseases, or from other incidental circumstances.

BUT, for the sake of greater perspicuity, I choose rather to describe the symptoms in the order in which they generally appear, and as peculiar to the several stages of the disease, and shall distinguish, as I go along, those which are more constant or essential from the less frequent or adventitious.

THE first indication of the approach of this disease is generally a change of colour in the face from the natural and usual look to a pale and bloated complexion, with a listlessness to action, or an aversion to any sort of exercise. When we examine narrowly the lips, or the caruncles of the eyes, where the blood-vessels lie most exposed, they appear of a greenish cast, meanwhile the person eats and drinks heartily, and seems in perfect health, except that his countenance and lazy, inactive disposition portend a future Scurvy.

THIS change of colour in the face, although it does not always precede the other symptoms, yet constantly attends them when advanced. Scorbutic people for the most part appear at first of a pale or yellowish hue, which becomes afterwards more darkish or livid (a).

THEIR former aversion to motion degenerates soon into an universal lassitude, with a stiffness and feebleness of their knees upon using exercise, upon which they are apt to be much fatigued, and upon that occasion subject to a breathless-

(a) Mr. Murray's remark.—They commonly appear of a melancholy and sullen countenance; such also is their disposition of mind; so that dejection of spirits may justly be reckoned a cause as well as symptom of the future malady.

ness or panting, and this lassitude with a breathlessness upon motion, are observed to be the most constant concomitants of the distemper.

THEIR gums soon after become itchy, swell, and are apt to bleed upon the gentlest frictions: their breath is then offensive, and upon looking into their mouths the gums appear of an unusual livid redness, are soft and spongy, and become afterwards extremely putrid and fungous, the pathognomic sign perhaps of the disease. They are subject not only to a bleeding from the gums, but prone to fall into hæmorrhages from other parts of the body. Their skin at this time feels dry, as it does through the whole course of the malady (b): in many especially, if feverish, it is extremely rough, in some it has an aserine appearance, but most frequently it is smooth and shining; and when examined, it is found covered with several redish, bluish, or rather black and livid spots, equal with the surface of the skin, resembling an extravasation under it, as it were from a bruise (c). These spots are of different sizes, from the bigness of a lentil to that of a hand's breadth, and larger; but the last are more uncommon in the beginning of the distemper, they being usually then but small and of an irregular roundish figure: they are to be seen chiefly on the legs and thighs; often on the arms, breast, and trunk of the body; but more rarely on the head and face. Many have a swelling of their legs, which is first observed on their ankles towards the evening, and hardly to be seen next morning; but after continuing a short time in this manner, it gradually advances up the leg, and the whole member becomes œdematous, with this difference only in some, that it does

(b) Mr. Murray.—Except in the last stage, when a cold, clammy moisture may be after observed on the skin, especially if the patient is subject to faintings.

(c) Idem.—The skin begins to look in spots with a yellow rim; from thence the deepness of the dye gradually increases till it becomes of a deep purple, and sometimes quite black.

not so easily yield to the finger, and preserves the impression of it longer afterwards than a true œdema.

THESE are most constant and essential symptoms of this malady in the progress of its first stage; but a diversity is sometimes observed in the order of their appearance. Thus, when a person has had a preceding fever, or a tedious fit of sickness, by which he has been much exhausted, the gums for the most part are first affected, and a lassitude constantly attends; whereas, when one has been confined from exercise by having a fractured bone, or from a bruise or hurt, these weak and debilitated parts become almost always first scorbutic (d); as for example, if a patient labours under a strain of the ankle, the legs, by becoming swelled, painful, and œdematous, and soon after covered with livid spots, give the first indication of the disease. And as old ulcers on the skin are very frequent among seamen, in this case likewise the legs are always first affected, and these ulcers put on the scorbutic appearance, although the patient seems otherwise perfectly healthy, and preserves a fresh, good colour in his face.

THE distinguishing characteristics of scorbutic ulcers are as follow: they afford no good digestions, but a thin, fetid, sanious stuff mixed with blood, which at length has the true appearance of coagulated gore lying caked on the surface of

(d) Mr. Ives.—As was the case of John Thomas, mariner, belonging to the Dragon, who on the 18th of August 1742 got, by a musket-ball from the Spaniards, a very bad fracture of the os humeri with great comminution: eight or ten large pieces of the bone were cut in upon and taken away, and the bone shivered quite to its head. By the end of November following an union was brought about by means of an intervening callus, and a sound skin brought over almost all the incisions. He had nearly recovered his flesh and strength lost under the discharge and confinement, being daily supplied with fresh provisions by the bounty of the officers. Upon the Scurvy breaking out in December his supply of fresh provisions was stopped, and given to more necessitous objects as was thought, he being then pretty healthy; upon which he fell into a bad Scurvy, the first symptom of which that appeared was the breaking out of the late wounds in his arm: he sunk under the discharge, and died at Mahon hospital.

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the ulcer, and is with great difficulty wiped off, or separated from the parts below; the flesh underneath these sloughs feels to the probe soft or spongy, and is very putrid. No detergents or escharotics are here of any service; for though such sloughs be with great pains taken away, they are found again at next dressing, where the same sanguineous, putrid appearance always presents itself; their edges are generally of a livid colour, and puffed up with excrescences of proud flesh arising from below under the skin. When too tight a compression is made in order to keep the fungus from rising, they are apt to have a gangrenous disposition, and the member never fails to become œdematous, painful, and for the most part spotted. As the disease increases, they at length come to shoot out a soft bloody fungus, which the sailors express by the name of bullock's liver; and indeed it has a near resemblance in consistence and colour to that substance when boiled: it often rises in a night's time to a monstrous size, and although destroyed by cauteries, actual or potential, or cut smooth with a bistoury (in which case a plentiful hæmorrhage generally ensues) is found at next dressing as large as ever; they continue however in this condition a considerable time without affecting the bone.

THE slightest bruises and wounds of scorbutic persons degenerate into such ulcers; their appearance, on whatever part of the body, is so singular and uniform, and they are so easily distinguished from all others, by being so remarkably putrid, bloody, and fungous, that we cannot here but take notice of the impropriety of referring most of the inveterate and obstinate ulcers in the legs, with very different appearances, to the Scurvy, which are generally best cured by giving mercurial medicines, whereas that medicine, in a truly scorbutic ulcer, is the most dangerous and pernicious that can be administered.

BUT to proceed: the first remark to be made upon this disease is, that whatever former ailment the patient has had (especially

(especially rheumatic pains, aches from bruises, hurts, wounds, &c.) or whatever present disorder he labours under, upon being afflicted with this distemper, his former and old complaints are renewed, and his present malady, whatever it may be, rendered worse. Scorbutic people, as the disease advances, are seldom indeed free from complaints, especially of pains; though they have not the same seat in all, and even in the same person often shift their place. Some complain of an universal pain in their bones, as they express it, most violent in their limbs and small of the back, and especially on their joints and legs when swelled: but the most frequent seat of their pain is in some part of the breast, a tightness and oppression there, with stitches felt upon coughing, being usual symptoms in this disease. And as scorbutic pains in general are very liable to move from one place to another, so they are always exasperated by motion of any sort, especially the pain of the back, which upon this occasion proves very troublesome.

THE next thing observable here is, that whatever diseases are epidemical at the same time with the Scurvy, or even whatever intercurrent disease prevails, these scorbutical habits are very liable to be seized with it; and this sometimes happens when such distempers would appear to be of a pretty opposite genius to the Scurvy; and which case is lucky for the patient; but on the contrary, if the prevailing distempers are of a putrid nature, such as the small-pox, measles, dysenteric fever, &c. it is then that, co-operating with the scorbutic acrimony, they produce the most fatal and malignant symptoms.

I OBSERVED a considerable difference in the genius of the disease in the two cruises ann. 1746 and 1747; in the latter; when fevers from cold of the pleuritic and peripneumonic sort prevailed, they tended chiefly to affect the breast with a tightness, oppression, and a hard-bound cough, by which a very viscid phlegm was with great difficulty brought up: the

fits of coughing were not constant, but extremely fatiguing; and this was an universal complaint. Several at this season were feverish; we had none in a salivation, and the fluxes were mild and manageable; whereas in the year 1746, when a different species of diseases prevailed, occasioned by the unwholesome newness of the ship's timber, and diarrhoeas were frequent, the Scurvy proved more virulent and fatal: its worst, most common, and troublesome symptoms were salivations and dysenteries, especially the latter, in which one Nicholas died, and eight or ten more were landed at Plymouth in a very low and exhausted condition by it. I did not at that time remark any of them to be feverish, and their breasts were but slightly affected. John Hearn was our patient in both cruises; his case begins in my diary under the 24th of June 1746, thus; he had been afflicted with the Scurvy for some time past; it first appeared with sore spongy gums, pain, and cedematous swellings of his legs, weakness, &c. has taken elixir of vitriol twice a day for a considerable time, but grows daily worse; has a continual salivation, at the rate of two quarts in twenty-four hours, attended with severe gripes and tenesmus; the salivation soon stopped, but was followed with a violent dysentery, which continued until he was landed. I find him again mentioned under the 15th of May 1757. J. Hearn complains of a lassitude and stiffness of his limbs, with a pain in his back; upon examination we find his legs covered with red, black, and livid spots; his gums are swelled; his chief complaint is a troublesome, fatiguing cough, and this last was what afflicted him most during the whole cruise.

I BELIEVE indeed it will universally be found, that in the progress of this distress the breast is always more or less affected, unless the belly is very open: the pain shifts from one part of it to another, often to opposite sides, and is at first perceived upon coughing only; but when the malady is farther advanced, it commonly fixes in a particular part, most frequently

frequently in the side, where it becomes extremely severe and pungent, so as to affect the breathing; a dangerous symptom in this disease (e).

THE head is seldom or never affected with pain, unless the patient is feverish. As to fevers, it may indeed be doubted whether there be any such as are purely and truly scorbutical, the disease being altogether of a chronic nature, and fevers may be justly reckoned amongst its adventitious symptoms. I have been told by an intelligent surgeon, who has had opportunity of seeing some hundred scorbutical cases, and those of the worst kind, that he remarked very few of them to be attended with fevers, which, to the best of his remembrance, always proved mortal; and I am convinced that fevers of any sort do prove fatal, though they very seldom occur in the last stage of the malady (f).

I OBSERVED before, that in the year 1746 none of our scorbutical patients were feverish; but in the cruise in the year 1747, several had the fever in the beginning of the distemper: the symptoms were not so violent nor inflammatory in scorbutical people as in others; in two or three it assumed

(e) Mr. Murray.—This pain in some measure answers to the description of the pleuritis notha; and, like it, is sometimes, but not always, to be relieved by blisters, the application of which, however, is not here safe, as there is some danger of a gangrene from them. I have likewise often observed a pain of the breast, I think mostly in the left side, in scorbutic fluxes, and always found it mortal.

(f) Mr. Ives.—I cannot say I have ever seen an instance of it; for I did not remember, nor can I find in my journals, one case of a person advanced in the Scurvy being seized with a fever. I intirely agree with you, that this disease is purely chronic. Ulcerated lungs are a common consequence of the Scurvy; and where there has been a violent cough and stitches preceding, it is certain I may have perceived the pulse to have quickened, and possibly too an increase of heat in the skin; yet these circumstances seemed to me altogether symptomatic, and not properly to be denominated a fever with the Scurvy; for after a rupture in the pulmonic texture, the commotion of the blood and heat of the body generally cease.

an intermitting from, and in this state I observed it to be altogether mild and without danger.

ONE Daniel Harlyhee, having an obstinate ulcer on his shin, his legs, about the beginning of May 1747, became painful and oedematous, and his ulcer truly scorbutic; on the 12th of that month he was seized with a pretty smart fever, which abated next day, but returned regularly every third day for five weeks, till he arrived at Plymouth: his gums were putrid; he had a pain in his breast, together with a cough, and the other scorbutic symptoms usual at that season.

BUT of all species of fevers that may be superadded to this disease, the most terrible, more so perhaps than even the plague itself, is that of the petechial fever or gaol distemper, as it is called, which has sometimes been contracted in large crowded and sickly ships, either from infection, or by keeping scorbutical patients long confined in foul, putrid air (g).

(g) Of this indeed I have never seen any instance, but have been favoured with the following account of it from Mr. Murray, when surgeon of the Canterbury.

He observed in that ship, during an epidemical rage of the Scurvy, when at the same time they had on board some petechial fevers, that several were seized with a slight fever, which was abated the third or fourth day, upon the appearance of a miliary, erysipelatous, or herpetical eruption, for the most part on the inferior extremities: these eruptions gradually grow livid, from thence black and gangrenous, attended with or producing sordid and sanious ulcers, spinæ ventosæ, and caries of the most obstinate and dangerous kind, spreading always upwards, seldom or never downwards: the gums were in this case lax, not much swelled, but often bleeding, and soon attended with caries of the jaw, from the sockets of which the already-loosened teeth easily dropped out. The patient was continually thirsty, the skin dry and hot, the pulse small and quick, the eyes sometimes staring, oftener moving quick and looking wild, with a despairing, moving aspect; the tongue moist and tremulous, the patient restless, and sometimes delirious: this dreadful evil soon carried off the unhappy sufferer, if remedies were not immediately administered; or rather nature had not strength enough to disburden herself upon some of the extremities, especially the inferior, as before remarked, generally a little below the knee, where carious or cancerous ulcers made quick ravage, were attended with the most exquisite pain, and often quickly dispatched the patient, blessing him with death.

LASTLY, According to the habit and constitution of the patient, there will occur likewise some little diversity in the state of the body in this disease; some through the whole course of it being regular enough in their belly, while others are apt to be very costive; but generally scorbutic persons are inclinable to loose stools at times, which in all are remarkably fetid. The urine I found to be extremely various at different times, even in the same patient, except that it is generally high coloured, and soon becomes rank and fetid (h): the pulse likewise varies according to the habit of the patient and state of the malady, being most commonly slower and feebler than when in health (i).

THE true scorbutic spots, as was said before, are always flat and equal with the surface of the skin; I have, however, observed the legs at the same time, when greatly swelled, sometimes covered with a dry scurf or scales; at other times, though very rarely, there appear on the skin small eruptions of the dry miliary kind.

IN the second stage of this disease they most commonly lose the use of their limbs, having a contraction in the flexor tendons in the ham, with a swelling and pain in the joint of the knee; indeed a stiffness in these tendons, and a weakness in the knees, appear pretty early in this disease, generally terminating in a contracted and swelled joint. They are subject

(h) Mr. Murray.—The urine of almost all scorbutic persons, when let stand, gathers an oily saline scum at top.

(i) Idem.—Where there is fever, the pulse is generally small, but hard and quick. You say that Eusebius, and the authors who have followed him, tell us that in scorbutic faintings the pulse rises and becomes stronger; this singularity I think I must have observed, had it been so: in such cases the pulse is for the most part obscure and small; sometimes rising all of a sudden for a few strokes, soon sinking, and always intermitting. In the fever mentioned, unless a flux accompanied it, faintings were less frequent, the pulse was quick and serrated, and sometimes ran like quicksilver in a flexible tube pushed along by Rarts.

to frequent languors, and, when long confined from exercise, to a proneness to faint upon the least motion of the body, which are most peculiar, constant, and essential symptoms of this stage. Some have their legs monstrously swelled, and covered with one or more large livid spots or ecchymoses; others have hard swellings there in different places, extremely painful; and others I have seen, without any swelling, have the calf of the leg (k) quite indurated.

THEY are apt, upon being moved, or exposed to the fresh air, suddenly to expire: this happened to one of our people, when in the boat going to land at Plymouth hospital. It was remarkable he had made shift to get there without any assistance, while many others were obliged to be carried out upon their beds: he had a deep scorbutical colour in his face (l), with complaints in his breast; he panted for about half a minute, then expired (m).

SCORBUTIC people are at all times, but more especially in this stage, subject to profuse hæmorrhages from different parts of the body, as from the nose, gums, intestines, lungs, &c. and from their ulcers, which generally bleed very plentifully. Many at this time are afflicted with violent dysenteries, accompanied with exquisite pain, by which they are reduced to the lowest and most weakly condition; while others I have seen, without a diarrhœa or gripes, discharge great quantities of pure blood by the anus.

THE gums are for the most part excessively fungous, with an intolerable degree of stench, putrefaction, and pain; sometimes deeply ulcerated, with a gangrenous aspect; but I

(k) Mr. Ives.—And thighs too.

(l) Mr. Murray.—In this stage I have seen livid maculæ or spots in the face.

(m) Mr. Ives.—Of this I have seen many instances, when they are imprudently brought up from the orlope to the fresh air; the utmost caution and circumspection are here requisite.

never remarked, except in cases of salivations, the back part of the throat or upper part of the mouth much affected; and I believe the lips seldom or never are. The teeth most commonly become quite loose, and often fall out; but a caries of the jaw does but rarely follow.

UPON this occasion it must be noted, that a scorbutic caries happens only in two cases: first, if the outer lamella of a bone has been broken off, so as that the scorbutic, corrosive humour stagnating in any of the cavities of the body, has access to the internal cellular substance, it speedily corrupts and gangrenes it. But otherwise ulcers continue long on the spine of the tibia, and other parts, without affecting the bone; except another and rare case, which is, when by the deepest and most virulent infection this cellular substance becomes tainted, which is commonly attended with excruciating pain, and always with an enlargement of the bone, or rather an exostosis, often the spina ventosa, followed with painful, spreading ulcers and an internal caries of the most malignant kind (n).

MOST, although not all, even in this stage, have a good appetite and their senses intire, though much dejected, and often low-spirited. When lying in their beds many make no complaint, either of pain or sickness, unless afflicted with the dysentery or a troublesome salivation: this last, indeed, I am inclined to think would happen but seldom, were it not occasioned by the exhibition of some mercurial medicine (o) in the cure

(n) Mr. Murray.—I never observed a carious bone to follow, but where there was a fever and most virulent Scurvy.

(o) Mr. Ives.—Did you in 1746 exhibit mercurials? If not, how do you account for the salivations that happened then? They would appear to me to have been purely scorbutic: I do not remember an instance of any considerable salivation in the Scurvy. Answer, It appears from my diary that we had then three patients in a salivation; viz. Rice Meredith, Robert Robinson, and John Hearn;

cure of ulcers or other scorbutical complaints, where it is often injudiciously administered; which, in such cases, in extreme small quantity induces a copious and dangerous salivation, almost always attended with the dysentery: these succeed each other alternately, so that the spitting generally ceases for a day or two, while the patient is racked with gripes and bloody stools, which being stopped for a little, the salivation again returns.

It is not easy to conceive a more dismal and diversified scene of misery than what is beheld in the third and last stage of this calamity, it being then that the anomalous and more extraordinary symptoms most commonly occur. It is not unusual at this time for such persons as have had ulcers formerly healed up, to have them break out afresh; while in others the skin of their swelled legs often bursts, particularly where soft, painful, livid swellings have been first observed; and these degenerate into such crude, bloody, fungous ulcers as formerly described. Some few at this period (though very rarely) fall into colliquative, putrid fevers, attended almost always with petechiæ, fetid sweats, &c. or rather sink under profuse evacuations of rotten blood, by stool and urine, from the lungs, nose, stomach, hæmorrhoidal veins, &c. (p); while the disease more frequently in others, by occasioning obstructions and putrefactions in the abdominal viscera, gives rise to a jaundice, dropsy, and the affectio hypochondriaca, or the most confirmed melancholy and despondency of mind, attended with severe nervous rigors, as also to violent colics, obstinate costiveness, &c. The termination of this disease in a fatal dropsy is very usual; the hydrops pectoris and ascites are most frequent; the anasarca and hydrocele more rare,

Hearn; the two first had taken gentle doses of mercurius alcalisatus, and about half a drachm of mercurial pill, but there is no mention of their having been given to Hearn: I am pretty clear he took no mercury.

(p) Mr. Ives.—All which I have often seen, except the fever.

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TOWARDS the close of this malady the breast is most commonly affected with a violent and uneasy straitness and compression, and an extreme dyspnoea, accompanied sometimes with a pain under the sternum, but more frequently in one of the sides; while others, without any complaint of pain, have their respiration become quickly contracted and laborious, ending in sudden and often unexpected death.

MANY more symptoms might be here added that at times have been observed, especially towards the close of this most virulent disease. And we shall have no occasion to be surprized, even at the most extraordinary which have been related by authors, when we examine by dissections the true state of the body at this period, with the high degree of putrefaction in the blood, the other humours, and viscera.

I HAVE been told by some practitioners that this is a disease not met with in people living at land in Great Britain; to such gentlemen I would recommend the serious perusal of an excellent chapter (r) in Dr. Huxham's late essay on fevers, where they will be made better acquainted (as is very necessary) with what is truly the scorbutic diathesis. Whatever number or diversity of symptoms may occur in this evil from difference of constitution, and especially at sea from the influence of such powerful causes as subsist there, yet putrid gums, blueish and black spots on the body, constitute its characteristic and pathognomonic signs every where.

As the before-mentioned learned author, my honoured friend, has published several very curious and truly scorbutical cases which occurred in England, I shall conclude this account, after giving some cases communicated to me more out of the common road, with an account of several Scurvies in Scotland.

(r) Chap. v. On the putrid and dissolved state of the blood.

(s) " SINCE the perusal of your treatise, I have met
 " with two remarkable instances of fevers preceding Scur-
 " vies so closely, that the latter seemed to prove a crisis
 " to the former: one was a young lady who had long la-
 " boured under ulcers of the legs; these being dried up,
 " she, after catching a severe cold, was seized with a peri-
 " pneumonia and delirium; upon the crisis of which by sweat
 " her delirium went off, and on a sudden her gums swelled,
 " all her teeth became loose, and her muscles of mastication
 " were so contracted and tense, without any remarkable
 " swelling, that she could neither move her jaw nor swallow,
 " but with the utmost difficulty; the fever immediately dis-
 " appeared; and having by proper gargles, fomentations,
 " orange juice, &c. abated the severity of the symptoms, with
 " a decoction of the bark effected a cure. The other was a
 " young man seized with the symptoms of an inflammatory
 " quinsy, where the fever ran so high, that I was obliged to
 " make copious and repeated evacuations by bleeding, purg-
 " ing, blistering, &c. The fever abated on the fourth day,
 " as also the pain in his throat; but he complained of a sore
 " mouth, and that he had a rash come out on his legs: look-
 " ing in his mouth, I found his gums loose and flabby, his
 " breath remarkably fetid, and upon his legs the true maculæ
 " scorbuticæ; I ordered him a gargle of tinct. rosar. and
 " tinct. myrrh. edulcorated with mel. rosar. and directed
 " him to eat a Seville orange or two every day, which cured
 " him in a short time. Both these cases occurred in the spring
 " 1754, when I remarked the Scurvy more epidemical here
 " at Wells, than I ever knew it at land: it chiefly affected
 " those who lived in damp, moist places, and was, doubtless,
 " rendered more frequent by the extraordinary moisture,
 " coldness, and backwardness of that spring season."

(t) JOHN A——, lieutenant of marines, forty years of
 age, was formerly extremely healthy, though much at sea,

(s) Extract of a Letter from Mr. Murray,

(t) Communicated by Mr. Ives.
 where

where he seldom or never eat of salt provisions, officers tables being generally well provided with better fare. He had lately returned from some channel cruise to the westward, where, as usual, he had not eaten of any thing salt, having a natural aversion to such food: one day, to his great surprize, he observed about the middle of one of his legs a considerable bunching up from over the tibia, and taking down his stocking found a blueish insensible swelling; next morning it was increased to the size of a large walnut; in two or three days the skin broke, and it became a genuine scorbutic ulcer with the liver-like fungus; after which began also other symptoms, change of colour, tightness in the breast, rotten gums, and, what was very threatening to his life, an obstinate constipation of the bowels, attended with intolerable gripings. He took country lodgings, and, being properly treated, in about six weeks or two months recovered.

N° L.

Letter from Dr. James Grainger, Physician in London, late Surgeon to Lieut. Gen. Pulteney's Regiment.

I HAVE extracted from my notes the following brief description of the Scurvy which prevailed anno 1751-2, among the six companies of our regiment quartered at Fort William.

I HAD then the opportunity of seeing it in near an hundred patients, and most ingenuously own, it was there I learned my first lesson upon the disease.

My predecessor had not informed me that this was a disorder of that garrison; it was a subject of which I had read much, but knew little; so that the first I treated had well nigh fallen a martyr to improper prescription: the pains the
 soldier

foldier complained of appeared to me rheumatic; this I the more easily gave into, as at that time this disease was actually frequent: he was bled, and treated accordingly; upon which his pains grew worse than ever, and no wonder. I began to talk seriously to him, and upbraided him with having pretended complaints more than real; but he soon gave me evident marks of genuine distress; livid spots on the thighs, rotten, bleeding gums, and his stinking breath, quickly convinced me that I had mistaken his case, and consequently the method of cure:

At aliquis malo fuit usus in illo.

THE Scurvy now began to spread, and I profited by my former inattention.

Its first appearances were lassitude, breathlessness upon the least quickness of motion, and a taste in the mouth peculiarly disagreeable; these were soon followed by rotten, spongy, painful gums, bleeding from the slightest touch, fetid breath, pains always of their thighs, frequently of their legs, sometimes of their loins, seldom of their arms: all these parts were sometimes discoloured with purple maculæ, which, as the malady increased, grew black and broad. The anterior parts of the legs and thighs chiefly suffered; the former I have seen all livid, the latter very closely spotted; neither were much swelled, yet both were harder than usual, and so extremely painful, that the gentlest touch gave agony: unless these were speedily checked, the contagion spread; their faces grew strangely fallow, their teeth loosened, palate and fauces ulcerated, asthma increased; they fell away, slept little, old ulcers broke out again; they cried out when turned in bed, and sometimes fainted upon motion of their bodies.

WHAT surprized me most was, that their appetite, even in these deplorable circumstances, was not greatly impaired, and that none of them could properly be said, though thirsty,

to be in a fever: all of them were rather costive, and their urine, though not copious, was always vastly fetid and thick, in those especially who complained of their loins; most of them were continually spitting; and a small quantity of mercury occasioned a dreadful salivation.

A SOLDIER who laboured under the venereal disease, with a scorbutical diathesis, used but a drachm of crude mercury, by way of unction, one evening; next morning I found him in a true mercurial salivation; the spitting went on, increasing until the tenth day, when the inside of his mouth, lips, and cheeks became monstrously swelled; the stench of his mouth was intolerable to all about him: he every day spit out a quantity of fetid blood, part of his gums, and teeth; he lost almost all the latter, and what was very remarkable, they were found preternaturally enlarged; his urine was extremely fetid, thick, and almost blackish. He often fainted away: in short, the poor fellow was reduced to the most deplorable condition, and with great difficulty escaped. It was three months afterwards before he was fit for duty (u).

THE Scurvy began in March, raged in April, declined in May, and left us before the middle of June; ninety during that period had Scurvies at Fort William; while at Fort Augustus, out of four companies there were only two soldiers seized with it, and but one in a captain's command at the barracks of Bernera: these three, indeed, were very bad. No officer had it in any of these garrisons.

I IMPUTED the malady to the following causes; 1mo, constant moist, rainy weather; 2do, salt provisions from December till near the end of May, salt-butter, cheese, oatmeal; 3tio, few or no vegetables, little, bad, or no milk; 4to, indifferent weather; and 5to, hard duty. The first, third, fourth, fifth causes prevailed less at Fort Augustus and

(u) Vide *Monita Siphylica*, auct. Jac. Grainger, p. 4.

Bernera, and therefore these places had not their proportion of scorbutic patients (w).

THIS disease is in several parts of Scotland called by the name of black legs: it has often been very epidemic and fatal to the miners at Strontian in Argyleshire; not long ago many of them died of it, with this remarkable symptom, that the hypochondria and lower belly were at length covered with large scorbutic maculæ; this Dodonæus (x), a good author on the Scurvy, long ago observed to be a mortal symptom.

I AM informed of a certain noble family, whose seat in the country is bleak, and exposed to the sea, where they have been universally afflicted with spongy, rotten gums, swelled legs, ulcers, &c.

LATELY a gentleman confined in gaol at Edinburgh complained of a swelling of his legs; upon examination they were found covered with black and blueish spots; soon after his gums became extremely putrid and fungous: his case being neglected, a caries of the lower jaw ensued, for which he was put under my care.

A NAVY-SURGEON residing in Fife, in passing by Backhaven was desired to visit two poor fellows who were extremely bad; he found them in a miserable condition indeed; their gums were monstrously putrid, their bodies spotted, and they were altogether deprived of the use of their limbs by a swelling in the joint of the knee; in one of them the tendons in the ham were contracted, and quite indurated. The gentleman acquainted them with the nature of their malady, and by a proper prescription restored them soon to health (y).

(w) See the remainder of this letter, chap. v.

(x) Vide Part III.

(y) See the prescription hereafter.

I HAVE been favoured with several letters by different gentlemen, giving an account of the unlucky and sometimes fatal errors they have fallen into by mistaking this disease: but as I choose now rather to publish my own faults than the misfortunes of others, I must ingenuously own (hoping it may, perhaps, be for the future benefit of practitioners) that before I had learned the nature and symptoms of this malady from observations, two patients fell under my care; in one of whom the disease proved fatal, and in the other extremely tedious, owing, in all probability, to improper treatment; at least, were such cases to occur to me at present, I would treat them in a very different way.

A GENTLEMAN, after a tedious salivation, in which he had used a large quantity of mercury, was reduced to great weakness of body, and affected with a tremulous disorder of his limbs, for which he took several doses of prepared crude antimony: though seemingly much mended in his health and looks, he soon after became afflicted with œdematous swellings on his legs, and as his teeth had not been fastened, several of them dropped out. He was put upon a course of restoratives; viz. a bitter steel wine, with an electuary of the bark and gum guajac. after using them for ten days, he fell into a diarrhœa, upon which account they were laid aside, and astringents with el. vitrioli prescribed; soon after this the tendons in the ham became so rigid that his legs were bent quite back, and in this pitiful condition he was deprived of the benefit of all exercise. When the flux had left him, recourse was again had to his former restorative medicines; embrocations, steams, and fomentations, were used to his contracted joints, but all to no purpose: at this time the putrefaction in the mouth was so great, that a caries of the jaw was suspected. The disease still gaining ground, he was suddenly seized with a large watery swelling of the scrotum, a hardness and fullness of the abdomen; an infusion of sem. sinap. n. moschat. and sal. absinth. in white wine was
admi-

administered. Various other unsuccessful methods were tried, but he died in about three months after his having been first afflicted with the Scurvy.

ANOTHER patient, who had kept the house for some days with a severe cough and pectoral disorder, was, upon these complaints leaving him, seized with rheumatic pains in his arms and legs, being otherwise in perfect health: he took several boluses of gum. guajac. and theriac. at bed-time without any sensible relief, and for a considerable time thirty drops of ol. tereb. three times a day, and afterwards half a drachm of flor. sulph. twice a day; notwithstanding which the pains increased, and became more universal. He at length observed his skin all over spotted; the spots were of a purple colour, and became daily more numerous; the pains in some parts were relieved by the eruptions, but he now complained much of an universal weariness and greater pains in his joints: he underwent a course of æthiops mineral and guajac. with decoc. lignor. Blisters were applied to his joints; a new symptom appeared, viz. a spurious sort of dysentery; he afterwards became greatly dejected in mind, and was subject to faintings. All this time the scorbutic spots continued out upon his body. Another person being upon this occasion consulted, the case was pronounced to be nervous; castor. fal. c. c. cephalic pills, tinct. sacra, epispastics, &c. were prescribed without procuring more than a temporary relief: at last, upon hearing some unexpected good news, which obliged him to go into the country, he found himself considerably relieved; and, after having undergone a very tedious course of medicines, was soon recovered by change of air, proper exercise, drinking of whey, and taking a gentle laxative when needful.

N° LI.

Extract of a Letter received from Dr. Huxham, Physician at Plymouth.

IN answer to your question, Whether we meet with many truly scorbutic cases in Devonshire and Cornwall amongst those who constantly live at land? I assure you we meet with very many patients of that kind, and even of such as are deeply afflicted with it, especially in low marshy grounds and situations nearly bordering on the sea, or the æstuarium. A very great number in particular are constantly found at Dartmouth, it lying exceedingly low, damp, and cold, and very little favoured with the sun, especially in the winter months, as also at Lowe and Faye in Cornwall we are in pretty much the like situation: in these places the Scurvy is, as it were, endemic from the lower degrees of it, viz. pustular eruptions, itching, spongy gums, fallow complexion, lassitude and inactivity, weak pulse, black and blue spots up and down the arms, legs, thighs, &c. a foul, greasy urine, loaded greatly with salino-sulphureous salts to its greatest degree of virulence, accompanied with fungous, livid, bleeding gums, horribly stinking breath, a fallow, bloated countenance, vast dejection of spirits and fainting, a tumid abdomen, tormina, dysentery, profuse hæmorrhages from various parts, a difficulty of breathing, especially upon the least motion, very large black, blue, yellow vibices, swelling, contractions and stiffness of the lower limbs, and fordid, spongy, livid ulcers on the legs, &c. with a load on the præcordia, and an anxiety scarce to be expressed.

I FIND this disorder chiefly amongst those who drink heavy fulsome malt liquors, such as we generally have in this country; who eat very few vegetables, and live mostly on flesh and fish, eating them not only at dinner, but supper; that lead inactive lives, and indulge too much in ease and appetite; nay,
many

many of our sedentary tradesmen very often fall into it, when they constantly drink the gross ale and beer of this country, and live chiefly on fish and salt provisions. On the contrary, the active, laborious husbandman, who drinks chiefly cyder, eats much herbage, fruits, &c. and breathes a free, open, country air, seldom or never is affected with it.

I HAVE lately met with two scorbutic cases, which I beg leave here to send you.

A YOUNG clergyman by intemperance, great irregularities, and a very sedentary life, contracted a highly scorbutic habit of body, with some degree of a jaundice: he had spongy, bleeding gums, a most nauseous breath, a great number of pustules and of black and livid spots all over his body, particularly on his arms, thighs, and legs; his legs were swelled, and on one of them was a fordid, fanious ulcer. He had frequent tormina, and now-and-then bloody stools; the abdomen grew hard and tumid; he breathed with difficulty on the slightest motion, and sometimes fell into a deliquium: he bled often profusely from his nose; and many days before his death a bloody, fetid ichor leaked continually from his gums and mouth. But what is very singular, and for which I mention the case, was, that three or four times a small stream of blood, not much bigger than a large horse-hair, burst out from the sound skin of his arm and hand, and twice from the palm of his hand, which squirted out to the distance at least of two or three feet, and was with difficulty restrained by a very able surgeon. He stunk so much before he died, that the last time I visited him I could scarce bear the stench of the chamber, though not a small one.

THE other was a gentleman of fortune and family, who had long indulged to the utmost intemperance, and yet scarce used any exercise, seldom going abroad, even in his coach, above four or five times a year: he always delighted in very high-

high-seasoned meats; and in a very astonishing manner, for two or three years before his death, would frequently swallow large quantities of the common volatile salts as other people would candied carraways: the consequence was, a hectic disorder, a vast eruption of pustules, black and blue spots and vibices all over his body, which caused a constant and intolerable itching, and by scratching continually he tore his skin in a most shocking manner. He lost every tooth in his head, and his gums were destroyed and wasted quite to the jaw-bone; he had always a fallow, and sometimes an icteric colour in his face, breast, &c. His urine was in small quantity and exceedingly high-coloured, as if some portion of blood and foot had been dissolved in it, with a great greasiness on the top, and sometimes a film of all the colours of the rainbow; his legs swelled considerably; his abdomen became very tense, and his breath short: his breath was very highly offensive, and his tongue always foul. He was often seized with sudden and great faintness. He at length died in the highest degree of a marasmus, having his nose and knees bent and fixed together, like as a crooked skeleton, for some weeks before his death: he indeed lived a year or two longer than I thought he could have done, under such a highly scorbutic, rotten state; but I am persuaded that his drinking very freely of the finest wines, and taking largely of the anti-scorbutic juices, greatly contributed to prolong his life: he was upwards of sixty when he died.

N^o LII.

The Cure of the Scurvy and its Symptoms.

[See Medical Museum, vol. I. p. 44 & seq.]

IF proper precautions were taken for the prevention of this disease, and the rules which have been laid down for that purpose were complied with, we should seldom have occasion

sion to meet with it in a high degree, either at sea or land. It is indeed difficult to persuade some to practise, when in health, what is necessary to preserve so valuable a blessing. All mankind have not the benefit of a pure, wholesome air, warm, dry lodging, with proper conveniencies to guard against the inclemency of different weather and seasons; many are also of necessity obliged to live upon such gross food as is not properly adapted to their digestive powers, to their constitution, and the exercise they use; so that from thence they may be apt to contract this evil: it is proper, therefore, to prescribe the cure of it as well as the prevention.

EXPERIENCE shews that the cure of the adventitious Scurvy is very simple, viz. a pure, dry air, with the use of green herbage or wholesome vegetables, almost of any sort, which for the most part prove effectual.

HENCE the first step to be taken towards its removal, when contracted either at sea or land, is change of air. We are upon this occasion informed by several authors of an old custom practised in some parts of Norway for the recovery of scorbutic people: they expose them in a neighbouring desert island in the summer season, there they live chiefly on cloud-berries; and it is remarked, that by eating plentifully of these, together with the change of air, they are restored to perfect health in a very short time. In that country, the fruits gathered by the diseased themselves are reputed of the greatest virtue: it no doubt is the case, as by this means the patient breathes the salutary country air in the open fields. Thus a free and pure country air, with such moderate exercise as at the same time conduces to the agreeable amusement of the mind, is requisite (a).

THEIR

(a) Mr. Murray.—What may be called rustication is the most beneficial exercise. When I was at the island of St. Thomas, all the scorbutic patients who could bear with being moved, were almost every day sent on shore by day-break, those who could not walk were carried a little way into the woods, where they

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THEIR food should be of light and easy digestion; the most proper is broths or soups made with fresh meat and plenty of vegetables; viz. cabbage, colworts, leaks, onions, &c. fresh and well-baked wheat bread must be given them; fallads of any kind are beneficial, but especially the mild, saponaceous herbs, dandelion, sorrel, endive, lettuce, fumitory, and purslain; to which may be added scurvy-grass, cresses, or any of the warmer species of plants, in order to correct the cooling qualities of some of the former; as experience shews the best cures are performed by a due mixture of the hotter and colder vegetables. Summer fruits of all sorts are here in a manner specific; viz. oranges, lemons, citrons, apples, &c. For drink, good sound beer, cyder, or Rhenish wine are to be prescribed.

THUS we have numberless instances of people, after long voyages, by a vegetable diet and good air, miraculously, as it were, recovered from deplorable Scurvies without the assistance of many medicines; for which indeed there is no great occasion, provided the green herbage and fresh broths keep the belly lax, and pass freely by urine, sweat, or perspiration; but when otherwise, it will be necessary to open the belly every other day or so by a decoction of tamarinds and prunes, adding some diuretic salts; and upon the intermediate days, to sweat the patient in a morning with camphorated boluses of theriac and warm draughts of decoct. lign. and, as has been usual in some of our hospitals, give twelve or fifteen grains of pil. scillit. pharm. Edinb. twice or thrice through the day.

were laid at their ease in the shade, while those who could walk were allowed to range about the woods, and directed to crop the leaves of the trees and shrubs as they went along: such herbs as they found of a fragrant and aromatic smell were put into bags. So soon as the heat of the day began to advance, they were all carried aboard; there they had water-gruel prepared for breakfast, their pained or rigid limbs were well fomented with a decoction of the fragrant herbs which they had plucked; afterwards they took their lime-juice and a small quantity of rum well diluted, then went to bed for a few hours, where sleep succeeding fatigue contributed its share towards the cure.

BUT

BUT it is here to be observed, that though the recovery of such persons seems promising and speedy at first, yet it requires a much longer continuance of the vegetable diet, and a proper regimen to perfect it, than is commonly imagined. There are many instances of seamen who have been sent from the hospitals after having been three weeks or a month on shore from their respective ships, who in all appearance were in perfect health, yet in a short time after their being on board relapsed, and became highly scorbutical. It were to be wished that either a longer continuance was allowed such men at the hospital, or that their cure was rendered more perfect by a sweating course.

IT is indeed frequently experienced that people once deeply infected are extremely apt to relapse into symptoms of this disease in different periods of their life afterwards; there are likewise some particular constitutions who, from the peculiar tendency and disposition of their humours to the scorbutic corruption, are from much slighter causes more liable than others to fall into the Scurvy: in such cases these people, in order to purify their blood from this deep-seated scorbutic taint or tendency, besides the diet and regimen before recommended, should also have recourse to other medicinal helps; some of the best of which have been already mentioned; but which, in this place, I shall more particularly deliver:

FIRST, The method proper to remove a scorbutic habit of body, whether acquired by a deep infection or constitutional.

SECONDLY, The different treatment of scorbutic patients adapted to the various symptoms of their disease; when the urgency of such symptoms requires a particular attention, but especially when the general method of cure cannot be complied with.

THIRDLY, I shall observe what remedies have been recommended upon good authority, and are used in different countries. And,

FOURTHLY, Conclude with some necessary cautions and observations.

To begin with the first of these: In order thoroughly to subdue a scorbutic taint the physical intentions must be, to keep the outlets and emunctories of the body open and clear for the gentle evacuation of the scorbutic acrimony (viz. the belly, urinary passages, and excretory ducts of the skin); meanwhile the remaining mass of humours is rendered mild, soft, and balsamic by proper anti-scorbutic food and medicine. And it is remarked, that all the above evacuations are most successfully promoted when the medicines for these attentions are joined with anti-scorbutics.

HERE milk of all sorts, where it agrees with the constitution, is beneficial, as being a truly vegetable chyle, and emulsion prepared of the most succulent, wholesome herbs; but whey, by reason of its more diuretic and cleansing quality, is rather preferable; and upon this occasion the sal. polychrest. will be found a very useful addition, as it is a mild purgative, an excellent diuretic, and when taken in a small quantity, well diluted, evacuates plentifully, either by perspiration or urine, according as its operation is directed to the skin or kidneys by exercise, lying in bed, or keeping the body warmer or cooler.

GOATS of all animals afford the richest whey, possessed of the greatest anti-scorbutic virtues; it contains a most noble restorative, vegetable balsam, which in a singular manner sweetens and corrects the scorbutic acrimony.

THE succi scorbutici of the Edinburgh and London pharmacopœias, where the volatile acrimony of the hotter species of plants is qualified by a due quantity of the juice of Seville oranges, are likewise proper in their season: they will be experienced yet more serviceable, when made farther diuretic and cleansing by being clarified with whey. Besides taking them

them in this manner through the day, the patient ought to be sweated in a morning, twice or thrice a week, by draughts of the said juices mixed with sack-whey.

THIS method cannot be sufficiently recommended ; it is an evacuation which, of all others, scorbutic persons bear the best, and from which they find the greatest benefit ; what nature pointed out to the northern Indians for the cure of this their endemic evil (b), and which experience confirms to be a most efficacious remedy. It is practised with remarkable success by the surgeons at the Cape of Good Hope, who have the greatest opportunity of treating scorbutic seamen (c) ; is recommended by the first and best writers on this disease (d), and seems to have been the most usual way of their giving these juices.

THERE are besides other herbs, whose juices are here of eminent virtue ; such especially, from their saponaceous and mild, aperient quality, are dens leonis and fumaria : and an anti-scorbutic inferior to none is the juice of the tender sprouting tops of green wheat in the months of June and July, mixed with the juice of Seville oranges.

BUT during all these courses scorbutic habits will find great benefit by warm baths (provided there be no danger from an hæmorrhage) in which the aromatic and fragrant plants have been infused ; viz. rosemary, marjoram, thyme, &c. and these are preferable to the usual manner of sweating them in stoves or bagnios (e).

(b) Vide Part III. chap. 1.

(c) Vide Kôlben's Account of the Cape of Good Hope.

(d) Wierus, Albertus, &c.

(e) Mr. Murray.—There is a Method of sweating I do not observe you have taken notice of, and which is said to have proved serviceable to some of the unhappy men in the unfortunate Admiral Hoffer's squadron at the Bastimentos ; viz. burying the scorbutic limbs in hot sand.

IN the winter time, for the cure of this disease, genuine spruce-beer, with lemon and orange juice, is to be prescribed, or an anti-scorbutic ale by infusion of wormwood, rap. raphani, mustard-seeds, and the like, made gently laxative by addition of senna. It must be drank when pretty fresh or new. But the spring is the most favourable season for a perfect recovery from a scorbutic habit. The learned Van Swieten says he has often seen whole families cured of the Scurvy in Holland by the use of an ale for common drink a considerable time, in a cask of which some heads of red cabbage cut small, twelve handfuls of water-crelles or scurvy-grafs, and a pound of fresh horse-radish root had been previously infused (f).

HAVING said thus much on the cure of the disease in general, I come, secondly, to observe what is proper to be done for the removal of its most urgent symptoms. When first the patient complains of an itching and spunginess of the gums, with loose teeth, either a tincture of the bark in brandy or aluminous medicines will be found serviceable in putting a stop to the beginning laxity of these parts (g): but, upon the putrefaction increasing, a gargle is to be used of barley-water and mel. rosat. acidulated with some of the mineral acids; the sp. or elix. vitriol. is generally prescribed; but some have imagined sp. salis less hurtful to the teeth; the quantity of the acid must be proportioned to the greater or lesser degree of putrefaction in the parts. The fungus must be often removed, or, if needful, cut-away, and by frequent gargarising the mouth kept as clean as possible. Where the ulcers appear deep and spreading, they are to be checked with a touch of

(f) Comment. in Aphor. Boerh. 1160.

(g) Lac is of great esteem in Germany for laxity and spunginess of the gums; for this use the lac is boiled in water with the addition of a little alum, which promotes its solution; or a tincture is made from it with rectified spirits. Vide New Dispensatory, or Improvement of Quinsy on the article Lacca.

ol. vitriol. or sp. falis, either by itself or diluted, according as the patient bears it.

IN a spontaneous salivation, or, as is much oftener the case, when a copious spitting has unfortunately been induced by some mercurial medicine, where immediate danger is apprehended, speedy revulsion must be made from the salivary glands by epispastics applied to different parts of the body, sinapisms to the soles of the feet and hams, and by opening the belly with clysters and such gentle purgatives as operate only in the first passages: but the impetus of the blood and colliquated humours is here to be determined, particularly to the pores of the skin; a defect of perspiration, generally attended with a stricture and spasm on the cutis in scorbutic habits, being the true cause why the force of the mercury so powerfully falls upon the salivary glands; for this purpose, boluses of theriac, with camphire and flor. sulph. are to be given, and repeated every four or six hours, in order to force a sweat, which proves the best means of abating the strength of the salivation and rescuing the patient from the danger of being choaked by it. Gargles at the same time must be used, with oxym. scill. to attenuate the thick and viscous saliva. When by this management the most threatening danger is prevented, there generally continues for a considerable time a troublesome salivation with great putrefaction in the mouth, which it is very difficult to put a stop to; it may, however, be palliated by keeping the belly and urinary passages open with clysters, or by diuretic and gentle physic, avoiding all strong cathartics, or whatever may farther promote the dissolution of the blood: inviscating and glutinous medicines are sometimes serviceable; viz. gum arabic, ichthyocolla, &c. dissolved in common drink; astringent gargarisms of alum and a decoction of the cortex quercus are indispensably necessary, as also the cort. Peruv. and elixir vitriol. taken inwardly; meanwhile the strength of the patient must carefully be supported by warm

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mulled wines, &c. Such persons, when much exhausted, are to be confined altogether to a milk and vegetable diet.

WHEN the legs are swelled and œdematous, gentle frictions are to be used at first, with warm flannel or woollen cloths charged with the fumes of benzoin and amber, or any other of the aromatic gums, provided the swelling be small, soft, and not very painful, rolling up afterwards with an easy bandage from below upwards: but if the legs are much swelled, stiff, and painful, they must be fomented with a warm, discutient fomentation, which will afford some momentary relief, without putting a stop to the progress of the swelling; or, what I have found preferable, is the steam of the fomentation received by the member well covered round with a blanket or cloths; and this operation must be repeated night and morning: it is generally followed with remarkable suppleness and ease in the stiff and contracted joints. Upon this occasion I have indeed often prescribed the steam of warm water only, with the addition of a little vinegar or crude sal ammoniac. After receiving the fume on their joints closely covered up for half an hour, they are to be anointed with ol. palmæ. If such swellings are not removed soon after the patient is put upon a vegetable diet, the limb should be sweated by burning of spirits or with bags of warm salt.

ULCERS on the legs or any other part of the body require pretty much the same treatment; viz. very gentle compression in order to keep under the fungus, and such anti-septic applications as have been recommended for the putrid gums; viz. mel. rosat. acidulated with spir. vitriol. ung. Ægyptiac. &c. But nothing will avail where the patient cannot have vegetables or fruits (h).

(h) Mr. Murray.—I have applied a strong tincture of the bark, and found it of great benefit lately in some scorbutic ulcers.

IN dangerous hæmorrhages from these ulcers, or from the gums, nose, &c. the mineral acids, viz. spir. or el. vitrioli are to be given, and often repeated, in small quantities at a time, so that they may more certainly and easily enter the lacteals, and get into the blood; together with small doses of the cort. Peruv. when it agrees with the stomach: these likewise, with red wine, are the principal medicines to be relied upon in their putrid and colliquative fevers.

FOR pain of the limbs, in the small of the back and breast, and universally in most of their pains, whether fixed or wandering, the oxym. scill. is to be administered in a warm diaphoretic mixture, where wine must supply the place of a spirituous cordial; and the patient, upon going to bed, should by warm draughts of water-gruel with vinegar, or, in place of the latter, acetum theriacale, endeavour to force a sweat. But most of these complaints yield readily to the general method of cure, and can only be palliated until that is undergone (i).

THERE

(i) EXTRACT of a Letter from Mr. Murray.

N. B. The letters (a) (b) (c) (d) refer to some remarks subjoined.

Untoward fortune has too often placed me among a number of scorbutic patients, where vegetables and proper diet, and even many necessary medicines, were wanting, and where the very elements were our enemies; and I have spent many melancholy hours considering what was best to be done to overcome this enemy, and stop the progress of this often fatal and always loathsome distemper. And although I have seldom cured any patient without vegetables, yet the relief I have given to many amply rewarded my labour, and the reflection to this day gives me pleasure. I shall first give you my method in general, and then I can produce an instance of its success.

Many at the time had a miliary fever, which I then judged to be purely scorbutic; but since the receipt of your last I have altered my opinion, and submit to your decision, that there is no such thing as a fever that may be so termed. I was always averse to bleeding, for the reasons you give; yet if the Scurvy was the primary disease (as I then judged it) preceded by high febrile symptoms, and the habit was originally sound or plethoric, I never observed any hurt from the loss of a small quantity of blood, which made a succeeding vomit always more safe; and this was followed by a purge, either cooling or warm, as symptoms indicated: of the first sort were the purging salts, with sal tartar.

THERE remain two symptoms of this disease, which are of all others the most obstinate to remove, even though the patient

or tartar. vitriolat. dissolved in decoct. lignor. or infus. fennæ & tamarindor. &c. of the last kind was infus. amar. cum senna, with the addition of a proper quantity of canella alba; and these were repeated occasionally.

So soon as the symptoms of the Scurvy appeared, I discharged the use of salt meat, and confined my patients to the vegetable articles of diet and board, with what fresh victuals could be had from the officers tables: their common drink was decoct. lignor. with their allowance of rum (a) put into it. The medical course I put them under was, for the most part, a neutral mixture of vinegar and sal tartar. of which I gave from two to four ounces twice or thrice a day. Spirit. Minderer. was beneficial to some; but the small quantity of volatile salts or spirits carried to sea prevented that from being a general medicine. I have also given a mixture of cremor and sal tartar. with success, and sometimes tartar. vitriolat. (b). In violent scorbutic pains diaphoretic anodynes of acet. theriacal. or theriac. Andromach. with spirit. Minderer. and oxym. scillit. I have found very serviceable, as likewise the last in particular for disorders of the thorax: in visceral obstructions I give the ferulaceous gums, with gum guajac. soap, and tartar of vitriol; and sometimes added only gum guajac. and tartar of vitriol to the squill pills. The liver or spleen, or perhaps both, are sometimes affected, especially that lobe of the first which stretches over the pylorus: hence I have known violent pain at the pit of the stomach; and the hardness and pain I have sometimes observed at the fundus of that viscus, leave no doubt of the pancreas being also obstructed: the mesenteric glands share the same fate; hence, as observed in your description of this disease, towards the close of it, from these obstructions proceed violent colic pains, jaundice, &c. all which I have seen, as also great tension of the abdomen, henteries, &c. The appetite then begins to fail, the lungs are affected, respiration becomes contracted, the motion of the heart less vigorous, the circulation languid, and placid death closes the scene.

But to return to my practice at sea: Where there was any topical pain, I fomented with a lye of wood-ashes, in which was boiled camomile and elder-flowers, wormwood, rue, &c. and lemon-peel, when it could be got; for the fungous gums I made a powder of bol. armen. alum. rup. tart. vitriol. and gum. myrrh. washing them with infus. salviæ; to which I added alum. rup. and el. vitriol. or spir. sal. which served also in ulcers, when I added honey: these last I touched frequently with a rag dipped in mel Ægyptiac. rosat. spir. sal. detinct. myrrh. I dressed ulcers of the extremities chiefly with ung. Ægyptiac. mercurial. and liniment. Arcæi, mixed together. When the patient was altogether free from feverish symptoms, I gave three or four ounces twice a day, along with decoct. lignor. of the tinct. ad stomachic. (c) Pharm. Edinb. to which I added mustard-seed and canella alba. When he began to recover, I strenuously insisted on his using exercise, and embrocated the contracted joints or tendons as

you

patient enjoys the benefit of the purest air, with the most proper anti-scorbutic food and medicines. These are, the anti-

you direct. Such was my general practice, and the following is an instance of its success.

Benjamin Lovelay, aged twenty-five years, had a continual fever in September 1746, for which he was sent to the hospital at Louisburg, and from thence returned to all appearance well the 13th October following. On the 30th November (being taken ill the day before) he was feverish, and complained of violent pains in his bones and joints: upon account of the Scurvy being then epidemic, he was very sparingly blooded, took a vomit, and was purged; upon which the fever subsided a little, and there appeared a miliary eruption, soon after followed with the several scorbutic symptoms in the greatest degree; to which was added a violent pain in the pit of his stomach, inclining to the right side, often so violent as to make him shriek out: the symptoms continued upon the increase for some time, and at last he grew so bad as to faint away upon the least motion. The anti-scorbutic regimen above described was steadily pursued; his common drink was decoct. lignor. acidulated with elix. vitriol. His diet was water-gruel, rice, sago with wine, and sometimes a little fresh broth or meat from the officers' tables. The several forms of medicines already mentioned were administered as symptoms required; and I think he had almost every symptom belonging to the disease, attended with feverishness all along, till the decline of the distemper, when I added aloes and extract, gentian. to his pills, and began the use of the tinct. ad stomachic. The bile in most chronical diseases, especially in the Scurvy, is defective either in quality or quantity, and something must be given to supply its defects. The disease took a turn for the better in the beginning of January, and he returned to his duty on the 22d of February (d).

I shall use the freedom with my ingenious friend to make some remarks on his Letter.

- (a) Wine would probably have been better.
- (b) The medicines were no doubt properly adapted in the cases to which they seem to allude, which were feverish Scurvies; these saline neutral draughts being certainly preferable in such cases to the soap, squill, and garlick pills commonly prescribed in Scurvies without a fever.
- (c) The medicine recommended is truly an excellent restorative; proper for prevention of the Scurvy in such as are recovering from other diseases, and to confirm the strength of scorbutic persons when in the convalescent state; but I must own a like medicine did not agree with those who were in neither of these situations, to whom I gave it. Bitters of the terebinthinated kind, though dry and kept, also all fresh and succulent plants and fruits of this quality, are nevertheless most efficacious anti-scorbutics.
- (d) The case is curious and singular.

scorbutic dysentery in some, and in others a hard-bound cough, accompanied with dyspnoea, pain, and disorders in the breast; this last often ends in a consumption, while the former or flux is very troublesome to stop, and sometimes also proves fatal.

SCORBUTIC diarrhoeas at sea are not suddenly to be stopped, as the acrimonious humour must some way or other be discharged, and it may as well pass off by the guts, as by any other outlet; they, however, are to be moderated: the tone of the intestines must be strengthened; meanwhile the peccant humour is gently evacuated by small doses of rhubarb occasionally repeated; to which a little theriac. or diascord. is always to be joined, with a view to keep up perspiration, an important point; for this purpose decoctum Fracastor. or boluses of diascord. with other warm, diaphoretic, and strengthening medicines, are principally to be given, and opium more freely, in extreme cases; meanwhile the patient is supported with strong rough red wine and a glutinous sub-astringent diet: I have sometimes given four or five grains of crude alum in a diascord. bolus, where the blood was evacuated in great quantity; and when it passed the stomach without ruffling, it generally did service. In this last case tinct. rosar, well acidulated, and other styptics, are necessary.

I KNOW no peculiar treatment proper in the scorbutic dysentery, different from what has been recommended by authors on that disease, farther than that the use of greens, and especially of the austere and acid fruits, is to be permitted. I am informed by Mr. Christie, formerly surgeon to the naval hospital at Port Mahon, that, after trial of many medicines, he found an infusion of ipecacuan. in brandy, given in small quantities often repeated, the most effectual remedy to remove it. Rhubarb purges, stomachic bark-bitters, elixir vitriol. or the use of some light steel mineral water, will serve to perfect a recovery here, as in all other scorbutic cases where the patient

tient has been much exhausted by colliquative evacuations and hæmorrhages, usual in this disease.

For scorbutical pectoral disorders blistering and issues are proper at land, as also riding on horseback in the country air; an intire milk and vegetable diet; keeping the breast open by expectorants, such are oxym. scillit. gum. ammoniac. and bals. copaiv.

WHEN the scorbutic taint has been intirely subdued, it sometimes leaves behind it other disorders, which require the same treatment as is proper for them when proceeding from other causes, together with a mixture of anti-scorbutic medicines for farther security,

BESIDES the consumptive disposition now mentioned, a dropical habit is now-and-then contracted, or, what is more frequent, the legs remain swelled, oedematous, and ulcerated; in this last case, if the ulcers have been of long standing, sufficient provision being made for healing them up by purging, and issues near the part, an electuary of the prepared crude antimony may be given, with the addition of æthiops mineral (k); and at the same time an anti-scorbutic diet-drink used; or, provided they are obstinate and the gums sufficiently hardened, the patient may undergo a slow and gentle course of mercury.

IN scorbutic habits I generally kill the mercury with a small quantity of bals. sulph. tereb. and find it succeed well, where the intention is not to raise a copious salivation: a bottle of decoction of the woods must be drank every day at the same time; this, by promoting a diaphoresis, will assist the ope-

(k) Mr. Murray.—In some lax habits in warm climates I have known a dose of Spanish soap bring on a salivation. With regard to scorbutic habits, I have observed in them a copious salivation induced by well-prepared æthiops mineral, and have found a large dose of sal diureticus removed it speedily.

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ration of the mercury, and determine the dissolved humours more particularly to the cutaneous secretion. After this course a few grains of sulph. aur. antim. will perhaps be necessary evening and morning; or Dr. Plummer's medicine, and the continuance of the decoction of the woods; which in all probability will complete the cure.

THOSE that are troubled, after having been afflicted in the Scurvy, with numbness and pain in their joints, or chronic rheumatic pains, must practise riding, swallow a spoonful of unbeat mustard-seed once or twice a day, or undergo the mercurial course as above directed, and be well sweated.

IT may be now proper to observe, in the third place, what other remedies have been recommended for this disease, and are reputed in different countries; amongst which are to be reckoned the *pinus antiscorbutica* and the spruce shrub. The learned Boerhaave is said to have prescribed for the most part new-churned milk. Cort. Winteran. first came into repute from the good effects it was supposed to have had in Capt. Winter's crew, belonging to Sir Francis Drake's Squadron.

THERE is a remarkable observation given us by Bernard (n) of the great virtue of *herba vermicularis* (wall-pepper) in this disease: he boiled eight handfuls of the herb in eight pints of old ale, to half the quantity, in a close vessel; of this a warm draught, viz. three or four ounces, was taken every morning, or every other morning, on an empty stomach, as the patient bore it; which had the happy effect to cure almost all the soldiers of the army afflicted with this disease, except a few, who by the severity of the preceding winter were reduced into a condition past recovery. He remarked that those who were vomited easily and most plenti-

(n) Miscel. Curios. Med. Physic. Acad. Natur. Curios. ann. vi. & vii. obs. 22,

fully by the medicine soonest recovered: he made use of this decoction, with the addition of alum and mel rofat. by way of gargle for the gums, which were in all affected and putrid; and by this simple remedy cured above fifty, who had the tendons in the ham contracted, applying the boiled herb warm to the part. He bathed their ulcers with the same decoction, and applied the warm herb to them in like manner.

THERE is an instance given by Etmuller (o) of the soldiers in a besieged garrison greatly over-run with this disease, who were all perfectly cured by ruta muraria (white maiden-hair).

CHELIDONIUM minus (pile-wort, or little celandine) for its supposed great virtues has, by the Germans, been called Schorbocht rout: but the Danes (p) esteem most trifolium palustre (marsh trefoil) which they administer sometimes by itself, at other times with the addition of scurvy-grass.

IN Holland the turf-diggers, who are greatly subject to the Scurvy, and from thence afflicted with foul ulcers and swellings in the feet, use as their constant medicine eupatorium cannabinum (hemp agrimony) (q).

WE are informed (r) that the Swedes, ever since the surprising recovery of their troops when afflicted with this malady, by the use of a decoction of fir-tops, esteem it altogether specific in the Scurvy; the efficacy of which is farther confirmed by the experience of the people in Siberia, where

(o) Schroderi dilucidati Phytologia.

(p) Vide Act. Haffn. vol. iii. observ. 75. Etmul. Schrod. dilucid. Phytol. p. 104. Simon. Pauli Digress. de vera causa Febrium Scorbut. &c.

(q) Vide New Dispensatory, or Improvement of Quincy on the article Eupatorium cannabinum.

(r) Vide Moellenbroek, p. 116. Etmull. Schrod. dilucid. Phytol. p. 2.

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both the remedy and distemper are very frequent, according to the relation of a learned and accurate traveller (s).

IN Groenland, where this disease is extremely frequent, we are told by a gentleman (t) who twice visited the country, that the natives make use of scurvy-grass (u) and sorrel together, and that these two herbs, put with barley or oats in broths made of fowls or the flesh of rein-deer, have an effect to recover the diseased most surprizingly in a short time, even after having lost the use of their limbs.

THE Norway cure affords the only one well-attested instance of this distemper being successfully removed by what would

(s) *Tenellas pini summitates vulgus Sibiriae pro infallibili antiscorbutico remedio habet.* Gemell. in *Flor. Sibiriae*, p. 178.

(t) *Hermanius Nicolai.* Vide *Act. Hafn.* vol. i. obs. 9.

(u) EXTRACT of a Letter.

The ships which are annually employed in the whale-fishery, are of all others the best fitted out, both as to the variety and quality of their food; the voyage is short, and the seamen kept much in action; so that bad water and decayed provisions can scarcely fall to their share; yet it is notoriously known, that there is no part in the world where ships crews are so liable to the Scurvy, as in the polar circle. Those who are seized on their first entrance into the cold, find an increase of their symptoms when got into the ice; the attack of the malady is here more sudden, and its progress more rapid, than any-where else: the patient has seldom any cure or alleviation till the weather softens; for the month of July is very moderate, which is almost the only pause of winter, and at this time the scurvy-grass steps in and performs incredible wonders. I have been an eye-witness to many scorbutics, who have recovered in a few days from what one would judge an irrecoverable state, by a plentiful use of this Groenland salad: it is much coveted by the sound as well as sick. Our field and garden scurvy-grass are bitter and pungent, this is mild and esculent, resembling our sea scurvy-grass, or *cochlearia minima ex montibus Walliae*: it is said to acquire a pungency, if transplanted into warmer countries, but this circumstance I much doubt; however, be that as it will, its efficacy in the Scurvy is there an undoubted and daily experienced truth; and it may be justly deemed one of the most powerful anti-scorbutics in the world. Vegetable food prevails over the Sea-scurvy in all parts, but this re-inflates in as many hours, as any other course requires days. I cannot dismiss these reflections without observing how kind and provident nature has been in the plentiful supply of this plant every where in that country. *Ubi morbus ibi remedium*, is an observation of antiquity, and no where more justly verified than in the present case.

seem

seem so different from the nature of vegetables, as a fossil or earth. It is related by authors of undoubted credit (w), particularly by Petræus (x), and seems to have been known before Eugalenus had confounded most other diseases with the Scurvy, as it is taken notice of in the year 1624 by Senner-tus, when Eugalenus's writings in all probability might not have reached Norway. It is a redish or blackish earth dug up nigh Bergen, of which from half a drachm to a drachm is the dose; and operating by sweat, it is said to cure the patient in a short time.

I MENTIONED two very bad scorbutic cases which lately occurred in Fife (y); the surgeon upon seeing the patients inquired what had been their ordinary food, and whether they commonly eat any green herbs or vegetables: one of them, a fisherman, replied, that he lived upon bread, dried and salted fish, which was all he could afford, and sometimes salt beef, of which last he was very fond. The surgeon desired them to abstain from their former diet, in place of which they were to make two good meals a day of vegetable soup, prepared of colworts and other green garden stuff, and to eat water-creffes by way of fallad: he besides prescribed a fomentation for their legs, and gave them a dose or two of very gentle physic; by which means they both recovered; and one of them soon after, overjoyed upon being restored to the use of his limbs, walked several miles to return the gentleman thanks for his salutary advice.

I SHALL now conclude what I have to say on this head with the following cautions and observations:

(w) Vide Wormii Musæum. Bartholini Epist. cent. i. n. 39.

(x) Vide Dissert. Harmonic.

(y) Vide Med. Museum, p. 323.

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I. As to evacuations: It is to be observed that this disease, especially when advanced, by no means bears bleeding, even although the most acute pains upon the membranes, a high degree of fever, and dangerous hæmorrhages, would seem to indicate it; the patient generally dies soon after the operation; nor does it bear strong cathartics, which are often injudiciously administered in its commencement; many of which only farther promote the colliquation and acrimony of the blood and humours. The belly must at all times be kept open, but chiefly by such laxative food, when green vegetables cannot be obtained, as may answer their purpose; viz. barley and currants, stewed prunes, &c. or with a decoction of tamarinds, and cremor tartar. a morsel of lenitive elect. sea-water, and the like. From blisters there is danger of a gangrene; as to vomits, though I have never had any great experience of their effects, yet, by the observation of others, squill vomits have been found serviceable.

II. Persons in the advanced stages of this disease are not, without great caution and prudence, to be exposed to a sudden change of air, or brought from lying abed below in the hold of a ship to the fresh air, in order to their being landed; on this occasion, though seemingly pretty hearty, they are to be given a glass of generous wine well acidulated with lemon or orange juice, which is likewise the best cordial in their fainting fits: when they drop down seemingly dead, it were to be wished that some methods were tried for their recovery, as putting them into a warm bed, using of strong stimulants and frictions, blowing in the lungs, anus, &c. An uncommon degree of sloth and laziness which constantly accompanies this evil, is often mistaken for the wilful effect of the patient's natural disposition; this has proved fatal to many, some of whom, when obliged by their officers to climb up the shrouds, have been seen to expire, and fall down from the top of the mast.

III. AFTER

III. AFTER a long abstinence from greens and fruits, scorbutic persons should be treated like one almost starved to death, that is, not permitted for a few days to eat voraciously or surfeit themselves with them, otherwise they are apt to fall into a dysentery, which often proves mortal.

IV. LASTLY, There are but few medicines carried out in a sea-chest, which are here of service: those of fossil or mineral kind, such as steel, antimony, and especially mercury, do manifest harm. Opiates occasion an unaccountable lowness and dejection of spirits, with an oppression on the breast; when they are absolutely necessary, as in fluxes, they must be given always of the warmest kind, and agree best, when before or during their operation a stool is procured; after which the patient is to be refreshed with wine. Where the breast was much affected, I always gave them in a draught of squill mixture, or, in case the stools were not very frequent, I added a few grains of vitriolated tartar to the opiate bolus, in order to procure a discharge that way.

AFTER trial of many medicines in the sea-invoice there are but two I can principally recommend: the first is cort. Peruv. infused in wine; I gave at the same time a decoction of lign. guajac. (of which there is great plenty in ships) with the addition of rad. glycyrrh. which prevented the heart-burn that the decoction otherwise occasioned. The bark did not always agree with the stomach; but where it did, I observed a more favourable appearance upon the gums and ulcers by its checking the putrefaction; and in two instances where a gangrenous disposition was induced by too tight a roller, the suppuration next day was more laudable. It was of use in salivations and hæmorrhages; but rather hurtful in fluxes. Warm draughts of the decoction gave always relief, if the patient sweated, in which case the bark also agreed better.

BUT another, and more excellent medicine, is the oxym. scill. from which I have experienced extreme good effects ; it generally kept the belly open, and promoted the secretion of urine, by both evacuations discharging the acrimonious humours. It gave relief in many of their complaints, and particularly those of the breast, which scorbutic people are seldom free from. I had formerly gathered a great quantity of this root when at Minorca, and having made the oxym. scill. gave it to most of our patients in the year 1747, at the rate of one ounce, or an ounce and a half, in the space of twenty-four hours, with remarkable ease of their complaints (z).

Conclusion of Dr. Grainger's Letter (see p. 127.)
giving an Account of Scurvies at Fort William.

—WARNED by my former mistake, I never used the lancet, unless the patient was uncommonly plethoric, and then too a very small quantity of blood answered the purpose. I have seen fellows who have often borne the loss of twenty ounces, faint when only six were drawn from them at this time: upon standing it did not separate, but appeared like the blood in malignant fevers, altogether dissolved and of a livid colour. Some of the symptoms, vomits of ipecacuanha rather increased, viz. pains, faintishness, dyspnoea, bleeding of the gums, &c. they abated none of them. Indeed it was lucky that the stomach seldom required their administration.

PURGATIVES, however, were found highly beneficial, though repeated every third day ; they not only removed the troublesome symptoms arising from costiveness, but their ope-

(z) The eminent anti-scorbutic virtue of the squill or sea-onion, at the same time that it confutes the groundless opinion of the ill effects of acrid medicines in the most putrid Scurvies, in some measure confirms the efficacy of what I have recommended, and has been often experienced beneficial for prevention ; viz. common onions, and even garlick, as in some respects they are all of similar virtues.

ration, though sometimes pretty brisk, I never observed to impair the patient's strength, and always remarkably to abate their excruciating tortures. Although I gave at first an infusion of jalap, yet, observing bloody stools to have ensued on its use, I afterwards exchanged it for a ptisan of senna, with cremor tartar. which seemed to answer better. One man drank salt water every other day, and found it a serviceable purge. Would it cure the Scurvy?

BUT these, though useful, were not able alone to cope with the distemper: an attentive consideration of its symptoms seemed to shew it was putrid. On this I founded my practice, and had soon the pleasure to find that success confirmed my conjecture.

THE antiseptics I chiefly used were el. vitriol. to the quantity of half a drachm twice a day in water, or spir. nitr. dul. in a smaller dose: a gentle mador was also solicited by a bolus of camphire and nitre, of each half a scruple, given every night; for this purpose too they were allowed to drink plentifully of warm sage tea, which, with the assistance sometimes of a glass of mulled claret, seldom defeated our intentions. If they did not sweat, an increase of very fetid urine supplied happily that discharge. Greens were proper, but as they could not be had, broths made of young flesh, kid, &c. with barley, were indulged them, whilst camomile, drunk like tea, afforded a truly medical breakfast. The good effect of this management was soon visible in all.

ULCERS of the gums, &c. not only required the continuance of the prescribed measures, but the bark and detergent gargarisms were found indispensable auxiliaries. I have applied blisters to the pained members; the practice did not answer; they brought on a gangrenous disposition in one man, which bark and the strongest antiseptics with difficulty put a stop to; and in all rather increased their torments.

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THE following epithems were found highly anodyne :

R Spir. è hordeo elic. (vulgò whisky) acet. acerr. ana
lib j. spir. tereb. lib. fs. fal. tart. unc. fs. M.

The milder was, Whisky and vinegar, p. æq. camphire
and soap, q. f.

With one or other of these the discoloured and pained places were chafed ; their gums at the same time were not neglected ; the pain of them made the men extremely importunate for relief. Of all the applications at that time used, I found the greatest service from tobacco juice and tinct. myrrh. & aloës rubbed on them several times a day : alum-water and oak-bark decoction restored their usual firmness.

IN two weeks time, sometimes sooner, the symptoms began to abate, the maculæ turned brown, and in four weeks they complained only of weakness ; this, bathing in the sea and aromatic bitters with steel soon removed. I had the good fortune not to lose a single man.

Nº LIII.

A genuine Letter from an Italian Gentleman, concerning the Bite of the Tarantula.

[Translated from the Italian Original.]

S I R,

ACCORDING to your desire I send you an account of the effect the Bite of a Tarantula has upon the human body ; I shall only give a distinct detail of all the circumstances that I have seen, having once been instrumental to the cure of a poor plowman who was bit by that insect.

I WILL

I WILL not undertake to give you any account of the Tarantula itself, being sure you are perfectly well acquainted with it: I shall not only tell you what has happened in my country, at a small village called La Torre della Annuziata, about ten miles from Naples, where I was at the time the affair I am going to relate happened: it was in the month of October, a season of the year when all the students in Naples that have any relations in the country, have leave to visit them. I was one of those that enjoyed the privilege of visiting the place of my nativity; and as I was then studying music in the college of Naples, generally (whenever I went into the country) brought my violin with me.

It happened one day that a poor man was taken ill in the street, and it was soon known to be the effect of the Tarantula, because the country people have some undoubted signs to know it, and particularly (they say) that the Tarantula bites on the tip or under lip of one's ear, because it bites one when sleeping on the ground, and the wounded part becomes black, which happens three days after one is bit exactly at the hour of the hurt received: and they further assert, that if no one was to undertake to cure him, he would feel the effect of it every day at the same hour for the space of three or four hours, till it would throw him into such madness, as to destroy him in about a month's time; some (they say) have lived three months after they have been bit; but the latter I cannot believe, because it never happens that any man is suffered to die by such distemper, the priest of the parish being obliged to play on the fiddle in order to cure them; and it has not been known in the memory of man that any one died of it. But to proceed.

A POOR man was taken ill in a street (as I said before) and as the priest was out of the way, several gentlemen begged of me to play for that poor fellow; I could not help going without offending a number of my friends; when I was
there

there I saw a man stretched on the ground, who seemed as if he was just going to expire: the people at the sight of me cried out, Play, play the Tarantula, which is a tune made use of on such occasions. It happened that I had never heard that tune, consequently could not play it; I asked, what sort of a tune it was? they answered, that it was a kind of jig; I tried several jigs, but to no purpose, for the man was as motionless as before: the people still called out for the Tarantula, I told them I could not play it, but if any would sing it, I would learn it immediately; an old woman presented herself to me to do the good office, sung it in such an unintelligible sound of voice, that I could have no idea of it; but another woman came, and helped me to learn it, which I did in about ten minutes time, being a short one; but you must observe, that while I was learning the tune, and happened to feel the strain of the first two bars, the man began to move accordingly, got up as quick as lightning, and seemed as if he had been awakened by some frightful vision, and wildly stared about, still moving every joint of his body. As I had not yet learned the whole tune, I left off playing, not thinking it would have any effect on the man; but the instant I left off playing the man fell down, and cried out very loud; his face, legs, arms, and every other part of his body was distorted; he scraped the earth with his hands, and was in such contortions, that clearly indicated him to be in miserable agonies. I was frightened out of my wits, and made all the haste I could to learn the rest of the tune, which done, I played near him, I mean about four yards from him; the instant he heard me, he rose up as he did before, and danced as fast as any man could do; his dancing was very wild; he kept a perfect time in the dance, but had neither rule nor manner, only jumping and running to and fro, and making very comical postures, something like the Chinese dances we have sometimes seen on the stage, and otherwise every thing that he did was very wild. He sweated all over, and then the people cried out, Faster, faster, meaning that I should give

give a quicker motion to the tune, which I did so quick that I could hardly keep up playing, and the man still danced in time. I was very much fatigued, and though I had several persons behind me, some drying the sweat from my face, others blowing with a fan to keep me cool (for it was about two o'clock in the afternoon) others distancing the people so that they might not throng about me, yet, notwithstanding all this, I suffered much to keep up for so long time; for I played, without exaggeration, above two hours without the least interval.

WHEN the man had danced about an hour, the people gave him a naked sword, which he applied with the point in the palm of his hands, and made the sword jump from one hand into the other, which sword he held in equilibrium, and he kept still dancing. The people knew he wanted a sword, because, a little before he got it, he scratched his hands very hard, as if he would tear the flesh from them.

WHEN he had well pricked his hands, he got hold of the sword by the handle, and pricked also the upper part of his feet, and in about six minutes time his hands and feet bled in great abundance. He continued to use the sword for about a quarter of an hour, sometimes pricking his hands and sometimes his feet, with little or no intermission, then he threw it away, and kept on dancing.

WHEN he was quite spent with fatigue, his motion began to grow slower; but the people begged of me to keep up the same time, and as he could not dance accordingly, he only moved his body, and kept time; at last, after two hours dancing, he fell down quite motionless, and I gave over playing: the people took him up, carried him into a house, and put him into a large tub of tepid water; a surgeon bled him while he was bathing (he was let blood in both his hands and feet) and took from him a great quantity of blood; after

he had tied up the orifices, they put the poor man to bed, and then gave him a cordial, which they were obliged to force down, because he kept his teeth very close. About five minutes after he fell asleep, and sweated a great deal, which he did for five or six hours; when he awakened he was perfectly well, only weak from the great loss of blood he had sustained, and four days after he was intirely recovered, for I saw him walking in the streets; and what is remarkable, he hardly remembered any thing that had happened to him, and has never felt any other pains since, nor does any one, except they are bit again by the Tarantula.

THIS what I know of the Tarantula, which I hope will satisfy your curiosity, and as you are a great philosopher, you may philosophize as you please. I need not make any apology for my bad writing; you must excuse it, considering that it was only to obey your commands; if you have any other, you may dispose of,

S I R,

Your humble Servant,

STEPHEN STORACE.

N^o LIV.

The larger Share of the Tibia taken out, and afterwards supplied by a Callus. By Mr. David Laing, Surgeon at Jedburgh.

A GIRL in the parish of Maxton, about seven years old, who never had any disease except the small-pox, accidentally hurt her right leg, and soon after the teguments on the fore-part of the Tibia swelled a little, but were not discoloured till two months after, when a redness about the breadth of a six-pence appeared on the skin, and an ulcer soon followed, which made the patient's parents ask my advice.

THE

THE child was at this time much decayed, her flesh and strength being wasted, and her frequent pulse, great thirst, and want of appetite, with other appearances of a hectic disposition, made the prognosis very indifferent.

I CAUSED the part to be well fomented with emollients, and applied cataplasms of the same kind; but finding no advantage by the use of these, and discovering by the nature of the matter that came out of the sore, and by the colour, softness, &c. of the flesh, signs of the bone's being affected, though it was not yet in sight, I made a small incision in the tegument to lay the bone bare, by which my suspicions were fully confirmed.

I SOON now saw that the disease in the bone extended farther than the opening of the teguments; and therefore from time to time I enlarged the incision, till it came to the extremities of the affected piece of bone; which method I rather chose to follow than to hazard making at once, in this feeble, hectic patient, such a large opening as would have been necessary.

I DRESSED the sore with tincture of myrrh, caused the patient to take a decoction of the woods, with a small quantity of aq. calcis, twice a day, and gave her an anti-scorbutic and aperient medicated ale for ordinary drink.

AFTER continuing these dressings and medicines about six months, the bone I sent you was taken out (see the fore view of it in fig. 1. and the back view of it in fig. 2. plate IV.) you see it is the whole body of the Tibia, the length of the superior part of what remained towards the knee being three fingers breadth, and the inferior extremity towards the ankle being only one and a half long. In six weeks the sore was cicatrized, and in a month after the child began to walk, before the callus was sufficiently hardened, which made it turn a little crooked, as it still remains, but it is otherwise smooth

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and as hard and firm as any other bone of her body; so that she walks, dances, leaps, &c. without the assistance of a crutch or staff, and without the least observable halt.

TOWARDS the end of her cure I gave her tincture of antimony to remove a dry itch that was over her whole body; a considerable time after her leg was sound; a new ulcer appeared on the superior part of the arm, and now there are two sharp points of the os humeri standing out at the orifice in the teguments. This attack on a part that never received any injury, makes me of opinion that the ulcer of her leg was not occasioned by a hurt at school, which the parents assign as the cause of the disease, but that it was rather owing to her bad habit of body.

MR. William Carlyle, apothecary in Carlisle, favoured us lately with an history of a case very like to this: the part of the Tibia which was taken out is seven inches long; the boy to whom it belonged was twelve years old; the cure, which was almost performed by nature, was two years in being completed, and there is not any inconveniency remaining, except that the patient cannot stretch the heel of the leg out of which the bone was taken, so well to the ground as he does the other.

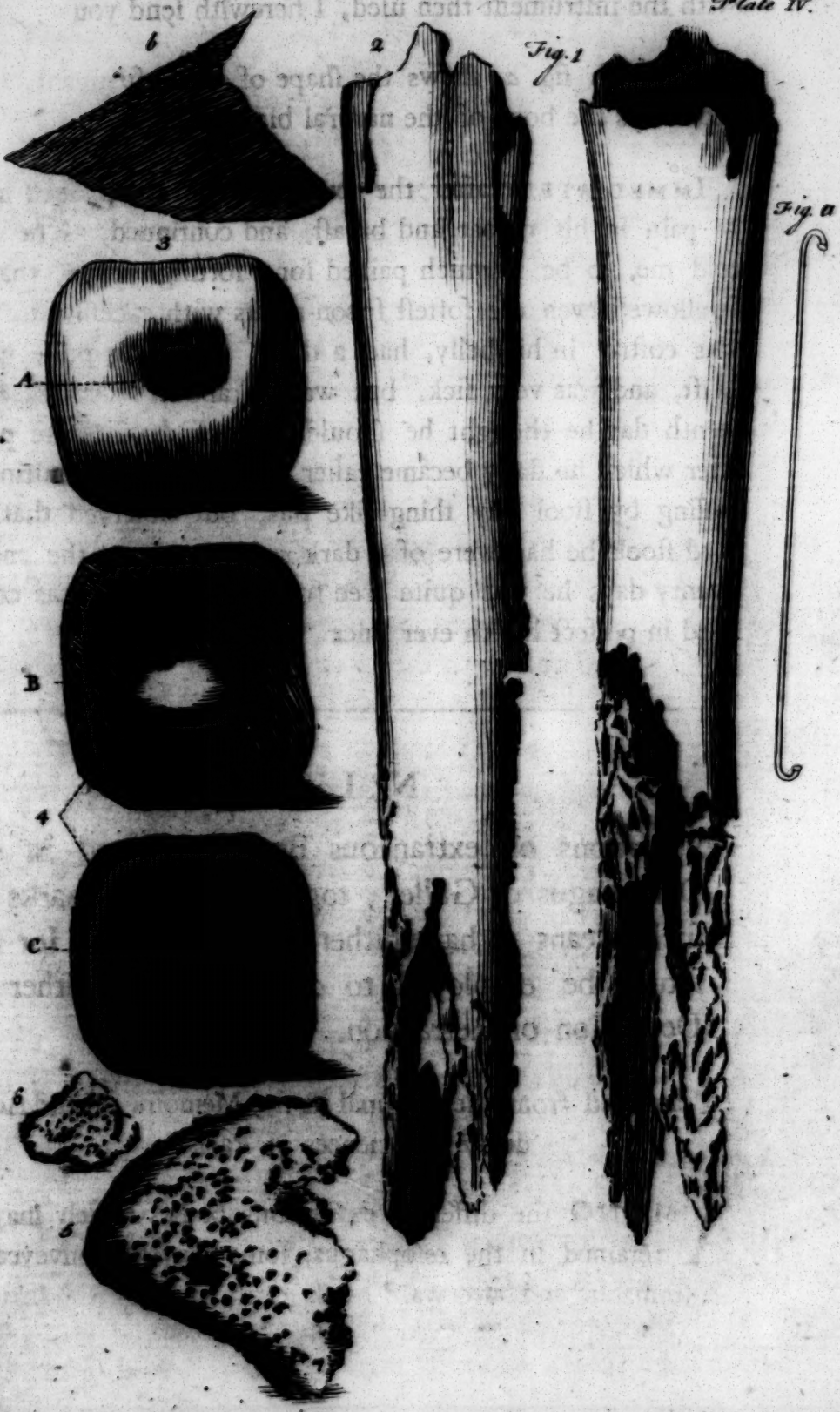
Nº LV.

An Account of a large Bone extracted from the lower Part of the Gullet. By Mr. John Stedman, Surgeon at Kinross.

IN March 1731, William Angus, a strong young man, servant to John Henderson, farmer in the Wood of Colerain in Kinross, hastily swallowed a large piece of the bone of a cow's head in a spoonful of broth; he made strong efforts to force it

and attempt which was an hour after I had been
examined. I was lucky enough to bring the bone away
without the instrument then used, I however found you

Plate IV.



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it down into his stomach, and was almost strangled before he swallowed it as far as an inch and a half above the xiphoid cartilage, where, but towards the left side of his thorax, he complained of a most violent acute pain. About twenty-four hours after he walked a mile to have my advice, but in such torture, that when I saw him, he could scarce either sit down or stand: he had eaten nothing from the time of this accident, and with the greatest difficulty could sip down any drink, though his thirst was great. He complained much of sickness, and his pulse was quick.

THE difficulty he had to admit any drops of liquor to pass into his stomach, made me despair of bringing away this bone by emetics, which, if they did not succeed, would undoubtedly make his case more desperate; I was also of opinion, that attempting to push it down into the stomach, by thrusting a sponge fastened to a piece of whalebone down his Oesophagus, would have no good chance to relieve him, because of the straight passage where the Gullet passes through the diaphragm, which would be still more straightened by the present irritation; and I could not promise what effects the bone might produce after it was lodged in the stomach.

THESE objections to the common methods made use of in analogous cases induced me to attempt an operation that I do not know is described by any author, which was, the extracting it by the mouth; for this end I caused a long rod of flexible steel to be made, and then bent each end of it into an oblong round, terminating at the extremity in a small button; this instrument I thrust down the Gullet, below the pained part, and then gently drew it up; which operation I was obliged to repeat fifteen times, turning the instrument sometimes to one side and then to the other, endeavouring to engage the middle of the bone in the hook. Every time I introduced the instrument he had a reaching to vomit, and always brought up a little blood with some other liquors: at
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the last attempt, which was an hour after I had begun the operation, I was lucky enough to bring the bone away, which, with the instrument then used, I herewith send you.

Plate IV. fig. *a*, shews the shape of the instrument, and *b* represents the bone of the natural bigness.

IMMEDIATELY after the extraction he complained much of pain in his throat and breast, and continued, as he since told me, to be so much pained for a fortnight after, that he swallowed even the softest spoon-meats with excessive torture, was costive in his belly, had a thirst, found his pulse going swift, and was very sick, but walked about. On the fourteenth day he thought he should have died with the pain; after which he daily became easier without either vomiting or passing by stool any thing like pus, but observed that the hard stools he had were of a dark red colour: at the end of twenty days he was quite free from pain, and he has continued in perfect health ever since.

Nº LVI.

Observations on extraneous Bodies retained in the Oesophagus or Gullet; together with Remarks on such Means as have hitherto been, or may for the future be employed to dislodge them, either by Depression or Retraction. By M. Hevin.

[Translated from the Original in the Memoirs of the Academy of Sciences at Paris.]

AMONG the different extraneous bodies which may be retained in the oesophagus, some may be conveyed to the stomach, and afterwards pass easily through the first organs of digestion; such are those substances which are capable of

of being softened, attenuated, or digested in the stomach; such also are those hard and dissoluble bodies whose form and size may facilitate their passage through the intestines: thus, when it is easier to propel these bodies than to retract them, we may depress or thrust them down into the stomach. There are others which by their hardness or their angular, unequal, and cutting figures are capable of irritating, lacerating, or dividing the parts they touch, which for this reason ought always to be retracted, if possible, in order to avoid the disorders they might produce, if they were forced through another passage. We are, however, sometimes obliged, notwithstanding this danger, to depress them into the stomach, because we cannot retract them, and because their presence in the œsophagus threatens the life of the patient with imminent danger. In a word, there are bodies swallowed or stopped in the Oesophagus, which can neither be retracted, nor evacuated by the natural passages when they are conveyed into the stomach: this last case is sometimes succeeded by terrible symptoms, in which, however, surgery is capable of affording considerable relief.

CASE I.

Extraneous bodies which stop in the Oesophagus, and may be pushed into the stomach.

EXTRANEOUS bodies which may, without producing any bad symptoms, be expelled through the first organs of digestion, are principally small bones which have neither points nor inequalities capable of wounding the stomach and intestines, portions of cartilaginous substances, small coins of gold, silver, or copper, leaden bullets, small beads of glass or crystal, nuts which have a smooth surface, portions of flesh, fruits, crusts of bread, and a great many other similar substances. Observations abound with examples of different bodies of this kind lodged in the Oesophagus, where they have produced terrible symptoms; from which the patients have been freed without
 5 any

any bad consequences, when these bodies have been conveyed into the stomach.

M. PERROTIN has communicated to the academy an observation, in which he relates, that a man who had lost all his teeth swallowed a large crust of hard bread, which remained in the inferior part of the Oesophagus, where it so exactly stopped up the passage of the aliments, whether liquid or solid, that the patient threw them up as soon as he had taken them: this crust could neither be loosened by the violent efforts the patient made to throw up the aliments he swallowed, nor by those arising from the irritation produced by the crust. Thirty hours were elapsed before the patient applied to M. Perrotin for relief; this surgeon being acquainted with these circumstances, took a small wax-candle, and, after having dipped it in oil, introduced it into the Oesophagus, and very easily conveyed the extraneous body into the stomach.

GLUTTONOUS persons are often exposed to similar accidents in swallowing pieces of flesh which are not sufficiently chewed. Ambrose Paré * facetiously relates the history of a taylor who had like to have been suffocated by a piece of an intestine, in endeavouring to have a larger share of a dish of tripe which he was eating with his comrades: the portion stuck in the middle of the Oesophagus; but Paré quickly pushed it into the stomach by means of a leek and some blows with his fist on the back. Forestus † relates a nearly similar history; but the symptoms, though troublesome, were not so urgent; a girl swallowed without chewing some hard and tough tripe, which stopped up her Oesophagus in such a manner, that she was three days without being able to convey any thing into her stomach. Schenckius ‡ also saw two persons who were like to have been suffocated by large portions of hard and smoaked flesh, which they had swallowed with precipitation.

* Lib. i. cap. 2.

† Lib. xv. obs. 28.

‡ Lib. iii. obs. 4.

LEATHER, and especially such as is supple, may be also placed among the number of those extraneous bodies which in their nature are not hurtful, and may be conveyed or pushed into the stomach without producing any bad effects: this was the method taken by Fabricius Hildanus * to relieve a shoemaker of Cologne, who in laughing had swallowed a piece of leather, which would have suffocated him, if Fabricius had not, with great expedition, freed the Oesophagus from it. He used a crooked silver probe to thrust it into the stomach, and this piece of leather was not discharged by the anus till more than six months after.

WE may also easily conceive that large and solid portions of fruit, not sufficiently chewed, may very readily be retained in the Oesophagus. In a word, Schenkius † informs us that a pregnant woman greedily, and almost without chewing, eat very hard green apples, some portions of which remained a little below the pharynx, and rendered the patient greatly in danger of suffocation. We are informed by M. de la Motte ‡ that a nurse was so imprudent as to give a child of six days old a sugar-plum to suck; but the kernel sticking in its throat produced symptoms which rendered the infant's life despaired of.

ALL these different bodies of the alimentary kind, which we have mentioned, that stopped in the Oesophagus, generally prove only dangerous by their bulk, but are not for that reason the less to be dreaded; for some of them are actually so large, that they may produce death very speedily.

M. LE DRAN has communicated an observation, in which he informs us that a man swallowed a large piece of mutton, which stuck in the Oesophagus; the patient retired in order to try to throw it up; the company perceiving the accident,

* Cent. i. obs. 3.

† Lib. iii. obs. 4.

‡ Tom. iv. obs. 332.

thought he had gone out with some other view; so that, remaining without any relief, he was suffocated: at last his companions, astonished that he did not return, became uneasy, and upon searching for him found him dead, leaning against a wall.

FABRICIUS HILDANUS *, on the same subject, has two remarkable observations, in one of which he gives us an account of an infant suffocated by a piece of cake; and in the other of a man who at breakfast swallowed a piece of the rind of broiled bacon, seasoned with crumbs of bread, salt, and pepper: this piece of flesh was engaged in the pharynx, and forthwith produced violent pains, shiverings, convulsions, and at last death. A similar accident happened to a young man, mentioned by Beckerus †; this man wanted to swallow a very large piece of flesh without chewing it; but as it stuck in the superior part of his throat, it forthwith choaked him. There are a great many persons who voluntarily expose themselves to danger, and suffer the fate of that man, who, according to Wierus ‡, undertook to swallow a whole egg, which stuck in the Oesophagus, and so strongly compressed the trachea arteria, that he was suffocated in a moment.

ON consulting observers, we shall find that fruits, on account of their solidity, are unquestionably more dangerous than other kinds of aliment: in a word, it is easily comprehended that when they are strongly engaged in the Oesophagus, they must necessarily compress the trachea arteria, and totally intercept respiration.

M. PUROS informs us, that a child who had received a chestnut, swallowed it intire; but as it stuck in his throat, it

* Cent. i. obs. 35.

† Boneti Med. Sept. de Oesoph. Affect. lib. iii. § 1. cap. 10.

‡ De Præstigi. Dæmon, lib. iv. cap. 2.

forthwith produced such urgent symptoms, that it was impossible to afford relief time enough to preserve the patient's life.

A YOUNG boy was suffocated by a pear which he had thrown up in the air to catch it in his mouth *. A woman died suddenly by swallowing an unripe pear without chewing it †. A musician, when singing, was suffocated by a fig thrown into his mouth, from some distance, by a thoughtless person ‡.

WE have already observed that hard bodies, whose bulk and figure permit them to pass easily through the intestines, are not greatly to be dreaded when they arrive at the stomach, though they may have passed through the Oesophagus with difficulty; and of this we have daily examples. Fabricius Hildanus || relates that a young man swallowed a small bone, which, sticking in his Oesophagus, caused very violent convulsions, and would have perhaps suffocated the patient, if Fabricius had not made the extraneous body descend quickly into his stomach. Helvigijs ** gives us the history of a child three years of age, who in playing with some pieces of silver swallowed two or three of them, which he discharged a few days after without having been in the least incommoded. He also informs us, that he saw another who had swallowed a small key and some small oblong balls of smooth glass, which were discharged by stool without producing any symptoms. Forestus also relates ††; that a certain man swallowed three

* Sueton. & Schenkijus, lib. ii. de Suffocat. obs. 1.

† Rhodius, cent. ii. obs. 50.

‡ Tryphon in I. Græcor. Epigram. & Varinus & Schenkijus, lib. ii. obs. 1.

|| Cent. i. obs. 36.

** Boneti Med. Sept. lib. iii. § 1. de Oesoph. Affect. cap. 10.

†† Lib. xv. obs. schol. ad obs. 23.

pieces of money, which were evacuated on the third day with the excrements. We find in Galen * a fact still less remarkable, which however we think it proper to mention; this author, then, informs us, that a person swallowed a piece of money, which passed into the stomach, and was easily discharged by stool. In the German Ephemerides † there is an account of a child's swallowing a florin without having any troublesome symptom produced. In the same Ephemerides ‡ there is an example of extraneous bodies, which will, perhaps, appear somewhat more extraordinary: a child swallowed a gold ring, which remained seven weeks in the stomach, after which it was discharged by stool, neither was the child incommoded during so considerable a time.

THE half of a pretty large piece of money, swallowed by a child of twelve years of age, justly merited the attention of Wedelius ||; because this fragment might, by its angles or inequalities, induce frightful symptoms, which it accordingly did, so long as it remained engaged in the Oesophagus. A surgeon having in vain attempted to draw it upwards, at last resolved to push it into the stomach, which he could not do without some trouble. By these means the infant was forthwith cured, and never afterwards felt any inconvenience from that cause.

THE observation of Meeckren §, on a child of five years of age, who swallowed a plate of metal, pretty large, and of an irregular figure, seems to be of great importance; since an extraneous body of this form might produce terrible effects. The child's health was not, however, impaired, nei-

* Lib. iii. de facult. natur. 4.

† Ann. viii. cent. 3, 4. obs. 121.

‡ Dec. ii. ann. x. obs. 6.

|| Boneti Med. Sept. lib. iii. de Oesoph. Affect. sect. i. cap. 9.

§ Obs. Med. Chirurg. Posthum. cap. 13.

ther was the evacuation of the plate perceived. The figure of this extraneous body is to be seen in the works of that author.

IT is less surprizing to find in observations a great many examples of pieces of lead swallowed, without producing any disorder; and leaden bullets are even looked upon as the most common and easy remedy for a miserere, or desperate iliac passion. This practice is indeed often dangerous; but though I have a bad notion of this remedy, yet I am persuaded that if these bullets are hurtful on such occasions, they are less so of themselves, than an account of the state of the indisposed parts which retain them, and must be wounded by them; so that such bodies are much less to be suspected in other cases. Forestus* informs us that his brother, when a child, swallowed a flattened bullet of lead, which he evacuated by stool on the third day, without being in the least incommoded. A child of five years of age swallowed a pretty large leaden seal, used for marking pieces of cloth. Wedelius†, who relates this fact, informs us that this extraneous body produced a violent pain till it fell into the stomach, after which this symptom ceased entirely.

THE following fact, communicated to us by M. Benomont, ought also to encourage us with respect to these kinds of extraneous bodies. A young lady, of fourteen years of age, swallowed one of the leads of a gown-sleeve, as broad as half a crown, as thick as three crowns, and of two ounces in weight. This body passed through the œsophagus with difficulty, on account of its bulk. The young lady, after the accident, complained to M. Benomont, of a weight in the region of the stomach. This surgeon ordered her to take now and then a little oil of sweet almonds, and some bolusses of fresh

* Obs. Med. lib. xv. Schol. ad Obs. 23.

† Boneti Med. Sept. de Oesoph. Affect. lib. i. cap. 9.

butter,

butter, by which means this extraneous body was on the sixth day evacuated by stool.

THOUGH copper be more to be dreaded than lead, as we shall afterwards observe, on account of the rust or verdegreafe which it may contract by its continuance in the viscera, yet it often produces no disorder; and sometimes its malignity manifests itself by very frightful symptoms, which at last are totally dissipated, without leaving the least marks of a bad impression. A man swallowed two copper coins, which stuck in the œsophagus for five weeks, and produced a violent pain, a spitting of blood, and a difficulty of swallowing solid aliments. These symptoms ceased entirely when the pieces of copper fell into the stomach, where they remained for six months, and were at last ejected by vomit*.

A CHILD of three years of age, mentioned by Widmarkler †, was still more happy; for having swallowed two links of a brass chain, of an inch diameter each, they only produced a pain in passing through the Oesophagus, which ceased as soon as they descended into the stomach, neither was it known when they were evacuated. We find from several examples, that such bodies may remain very long in the first organs of digestion, without producing any sensible disorder.

WE have given the history of a man who retained two pieces of copper coins in his stomach for six months; and the following observation is still more surprizing. A boy of eight years of age discharged by the anus a copper counter, which he had swallowed a year before. Amatus Lusitanus ‡ says, that this counter had no ill effect upon the child. This fact is very remarkable, because the counter was of copper. It seems

* Job. Muleni Thomæ Barthol.

† B. Bonet. Med. Sept. de Oesoph. Affect. lib. iii. sect. i. cap. 9.

‡ Cent. ii. curat. 69.

it would have been less surprizing if it had been of gold. However, Hochstetterus * relates, that a young man afflicted with the tooth-ach, put into his mouth a ducat of Portugeze gold, in order to alleviate the pain; but falling asleep he swallowed the ducat, and upon this he could hardly believe that he had done so. However, some months after, his voice became hoarse, and he was so emaciated, that he was obliged to have recourse to physicians and surgeons, who could neither feel the piece of gold with instruments, nor with their fingers. At the end of two years it was discharged by the mouth, and one of the faces was as white as if it had been rubbed with quicksilver.

It seems, however, that a considerable long continuance of the coin in the stomach depends rather on some extraordinary circumstances, than on the difficulty which these bodies find in passing the pylorus, in order to be conveyed through the intestines.

THIS remark is confirmed by a great number of observations, and among others, by that of M. de la Motte †, who tells us, that a child had swallowed three farthings, which stuck in the Oesophagus. This surgeon conveyed them into the stomach, by means of a leek, and they were evacuated next day by stool.

INDUSTRY has in all ages suggested different means to free the Oesophagus from extraneous bodies, which may, in all probability, be safely conveyed into the stomach; for we find that the antients, as well as the moderns, used sometimes leeks, or wax-candles dipped in oil; sometimes a crooked probe of silver or lead; at other times a small slip of iron or brass bended, and one of its extremities immersed in melted lead in order to form a kind of small button; others make the patient swallow a large piece of some aliment, such as the

* Dec. vi, cap. 10.

† Obs. Chir. tom. iv.

stem of lettuce, a turnip, a piece of biscuit, or a tender crust of bread, without chewing them; others recommend a dried fig turned inside outward, or a plum without its stone or skin. Some also for this purpose use a ball of lead, or a large bead tied to a small cord; a bit of beef, or a piece of new sponge, about as large as a nut, dipped in oil or some syrup, or covered with honey or turpentine, and securely fixed to the end of a strong thread. All these substances, pushed by the organic action of the Oesophagus, often carry the extraneous bodies along with them into the stomach.

MANY practitioners disapprove of the use of the sponge, because they think it hardly possible, that a small portion of so light a substance, tied to the end of a thread, should surmount the resistance made by a body which closes up the passage of the Oesophagus.

A no less important reflection may, in my opinion, be made on the larger portions of aliments ordered to be swallowed on such occasions; for when the Oesophagus is possessed by a considerable body which suffocates the patient, these portions will, if they fail to depress the extraneous body, contribute to make the patient die.

[To be continued in our next.]

Nº LVII.

Stones in the Kidney; with Remarks on the Operation of Nephrotomy. By Mr. John Douglas, Surgeon.

— — — — — aged fifty-three years, of a robust make of body, having large muscles, and remarkable big blood vessels; the veins of his arm, at the common bleeding-place, being to appearance an inch in diameter; was afflicted, since four years old,

old, with a violent pain in his right side, about the region of the kidney, from which he never was at any time perfectly free, but he often had tolerable intervals, otherwise he was very healthy.

IN his younger days he was salivated by Dr. Pitcairn's order, and had many different advices from several other physicians, but seldom got relief from any thing but the drinking large draughts of warm water, even to the quantity of twelve pounds. He more than once suffered such violent pain for some months, that he was obliged to lie the whole time on a coverlet laid on the floor; the pressure of his pained side on the hard floor, gave him some remission from pain. While the pain continued, all the urine he passed, after it had stood and cooled a little, became like gleet, or whites of eggs. He had often a diarrhoea, without any gripes, and could at pleasure even then refrain going to stool for a whole day: And in the same way he could retain his urine, till his bladder was so full, as to discharge near six pounds at once. Several meats and drinks, such as eggs, butter, fried meat, punch, and white wine, gave him pain; small malt liquor rather eased him, for which reason he ordinarily drank plentifully of it.

ABOUT the beginning of February 1731, he contracted a violent cough, which brought on a consumption, of which he died March 29th following; though by all appearance before that time, his lungs were in exceeding good condition.

I WAS allowed to open his body, before Dr. Robert Lewis and Mr. John Wallace, surgeon; and having always been of opinion that there was a stone in his right kidney, I resolved first to imitate the operation called by authors nephrotomy, which is said to have been performed successfully by Dominicus de Marchettis; but I met with such difficulties as gave me great reason to wish that either Marchettis had given us the account of it, or that the previous symptoms of Consul Hob-

son had been set down, whereby we might be certain of the stones having been cut out of the kidney itself, and all suspicions might have been removed of its having already made its way through the greatest part perhaps of the containing organs. The difficulties I mean, are the thickness of the common teguments and muscles, which was in this body no less than three inches and an half. When the peritoneum was laid bare, I observed the colon betwixt it and the convex surface of the kidney; after that gut was removed, a large nerve presented itself, lying just across the place where the kidney ought to have been cut; and the depth of my incision was now so great, that I found it impracticable to penetrate through the substance of the kidney into the pelvis; and therefore I turned the body into the common supine posture, and opening the kidney in the ordinary way of dissection, I took out the two stones herewith sent. See plate IV. fig. 5, 6.

THE larger, fig. 5, weighing half an ounce, was found in the pelvis; the figure of it you see is triangular, with its surface stuck full of small granulae, as big as coriander seeds, which seem to have been united after the stone had been formed, for they were of different hardness and colour, being black, whereas the surface of the stone below them is brown and firmer. The lesser stone, fig. 6, which weighed sixteen grains, and as if an irregular square figure, was lodged in the substance of the kidney. Besides these two, there were a great many other small stony concretions dispersed every where in the tubuli uriniferi; many of these were bigger than the largest grains of sea sand.

N^o LVIII.

Colicks for Six Years, from a Concretion formed on a Plum-stone lodged in the Guts. By Dr. Thomas Simson, Professor of Medicines in the University of St. Andrew's.

A GIRL about twelve years of age, who had been long troubled with colick pains, was last year under my management. She complained of pains fixed in one part about two inches below the short ribs of the left side, somewhat nearer to the back-bone than to the navel, where I was informed they had kept for at least three years; but for three years further back (in which they were confident she was subject to colicks) they had not observed whether the pains were fixed to one particular part or not. As to the occasion of these pains, the child's relations told me, that sometimes she took them when she could blame nothing, but that she never missed them some hours after eating pease, oranges, strawberries, or any other summer fruits, and upon taking any thing that was sour or hard of digestion; all of which for the most part produced a loose belly, which carried the trouble off; but if this did not happen, they were obliged to procure some stools by purges or clysters, which always succeeded till this attack of the disease, when I was consulted.

THIS fit, which was reckoned to have been occasioned by drinking small ale upon the turn, was accompanied with a violent constipation, and the pain was so violent, that she cried out in a most moving way, holding the affected side as firm as she could with her hand. Her stomach was so squeamish, that she threw up every thing immediately after swallowing it. Her pulse was the mean time of a natural strength and quickness; clysters had little effect on her, and though she got purgatives in different forms, and clysters were repeated some

hours after to solicit them downwards, yet they never were successful. Several other remedies were used at the same time, but all to no purpose. The pain and vomiting seldom left her for three weeks together, in which time, from the fatigue and want of sleep and nourishment, she was brought from a plump well coloured girl, to have much the countenance of a skeleton.

AFTER so many disappointments in my attempts to help her, and looking on her case as desperate, I was resolved to give her no more drugs; but early in a morning observing her to vomit a great deal of bile of a deep tincture, I began to suspect that the abounding of such a sharp liquor might be the occasion of her trouble, and, with that view, desired she might drink down an English pint, or a pint and a half of tepid water, to provoke her to vomit, and to repeat this six or seven times. She immediately fell about the work, and, with some small intervals, went through her task, which proved a remedy to her, but in a different manner from what I expected; for after she had vomited five or six times with the water, she had a demand to stool, which was copious; and in passing the faeces, she was sensible of something bulky and hard among them. Upon a search the ball herewith sent was found. See plate IV. fig. 3, 4.

THIS ball is, you see, of an irregular cubical shape, with a deep depression A, fig. 3, in two of its sides that are opposite to each other; it was four inches in circumference, and weighed five drachms at first, though now it is much lighter. It seems to be compounded of threads matted together, and disposed into layers (see fig. 4, which represents the two parts of it when it was cut through the middle). In the middle of it there is a plum-stone B, the flat sides of which answer to the depressions in its external surface; C shews the cavity in which the convexity B of the plum-stone was lodged.

I IMAGINED

I IMAGINED the plum-stone had been six years in my patient's body gathering the crust round it, and had occasioned the colicks so long. In the persuasion of her disease depending on this preternatural ball, I made no scruple, when asked by her friends whether I thought she would be any more troubled with these colicks, to give it as my opinion, that perhaps she might have some small relapses, till once the parts so long distended and compressed by the ball had recovered their natural state again, but that in a short time she would be quite free of them, since what I was confident was the cause was now removed, which has fallen out accordingly, she having had no fits these eight months except two; one she took pretty severely the tenth day after passing the ball, which was carried off by bathing and bleeding; a second she was seized with half a year after, by some cold, which went off without medicines; and all this while she has eat every thing that comes in her way, particularly pease and oranges, which of all things brought formerly the fit most certainly upon her.

THE end of last year I opened a brewer, who for many years past had very little respite from severe colick pains, arising from the right side above the haunch bone; under them he would have been some weeks tossed together, sometimes with a perpetual vomiting and great feverishness, and though the open belly often relieved him, yet he had often a looseness with the pain, by which disorders he was much decayed in his strength, though originally a very strong man, and at length, under the severity of a long continuing fit, expired.

UPON opening him, I found the hard tumour, which I easily felt externally, and always had judged in the mesentery, to be in the cœcum, which I slit quite across, and yet had difficulty to extract from it two large tumours, one about the bigness of a goose, and the other of an hen's egg, of the same substance with that in the preceding history, but more knobby; they lay in particular cells of that intestine,

which with the parts about was very much inflamed. The lesser, when cut through, had nothing heterogeneous in it; the greater had a bit of the broad extremity of a sheep's rib, near the largeness of the nail of my fore-finger, and somewhat triangular, not far from the most central part. Mr. Spencer, surgeon in Dunkeld, sent me one, some years ago, with a small cherry-stone in it, acquainting me that an old woman had passed five of them, about the bigness of walnuts, with one dose of physic. Mr. Robertson, surgeon in Crail, in the same way brought several from a patient, about the bigness of nutmegs; but none of them had any yolks, and were all of the same substance with what I have described, having seen several of them cut up. I have forgot if these gentlemen had observed any symptoms in their patients which they had referred to these concretions; but the honour and credit of our profession requires that such causes lie before us, when judging of the cholic frequently returning and arising from the same place.

N^o LIX.

Foreign Medical Literary Intelligence.

V I E N N A.

(Bibliotheque des Sciences, p. 231. Jan. Fevri. Mar.)

ANTONII de Haen, S.C.R.A. Majestatis Conciliarii, &c. Archiatri necnon medicinæ in hac alma et antiquissima universitate professoris primarii, societatis Harlemensis focii Pars septima rationis medendi, in nosocomio practico quod in gratiam & emolumentum medicinæ, studiosorum condidit Maria Theresia augustissima Romanorum imperatrix, &c. Viennæ, Austriæ sumptibus Hermannii Josephi Criichten, 1752, in 8vo. making

making 243 pages, without the dedication, which is addressed to the empress queen.

THIS work contains five chapters; in the first of which the author treats of the spurious or external aneurism: In the second, of a true aneurism: In the third, of an encysted dropfy and hydatides: In the fourth, of an aperture of the intestines near the anus, through which the excrement proceeded: In the fifth, he collects an assemblage of divers observations, through all of which the author manifests an extensive reading, affording many very interesting observations, particularly in the first chapter he gives one, not a little curious, on the use of the bark or quinquina, against a gangrene or sphacelus, arising from a disorder attended with an aneurism of the trunk of the femoral artery. In the space of seven months and a half, Dr. De Haen employed in the cure seven ounces of the extract of bark, six pounds and six ounces of the powder, thirty-four pounds and an half of the infusion, eleven pounds in fomentation, amounting in all to fifty-two pounds of the bark, besides the seven ounces of extract, which is to the amount of forty ducates in quinquina. Another digression with which the reader will not be displeased, is in the fifth chapter of this volume, which is upon the use of animal and factitious bezoars. The professor declares himself an enemy to heating medicines, of which he treats only with a view of informing practitioners of such ill effects as they are capable of producing in general, one may observe that Dr. De Haen meets with some of repugnant opinions, even amongst his disciples; and with regard to the opposite sentiments of strangers, he even treats them with such a warmth of temper, as does not always very strongly prejudice his reader in favour of him; but however he sometimes recollects himself, and returning philosophy disarms his indignation, and mitigates his rancour very opportunely, melting him down to a sort of temperate

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temperate moderation, founded on triumph and contempt; which sufficiently shew what he imagines upon such occasions.

II. NIC. JO. JAQUIN *Enumeratio Stirpium plerumque, quæ sponte crescunt in agro Vindobonensi, montibusque confinibus, cum tabulis æreis* in 8vo. Vindobon. 1762. or, A Catalogue of the Plants found about Vienna, and the Mountains in its Neighbourhood. By Nic. Jo. Jaquin. Illustrated with copper-plates, 8vo. Vienna, 1762.

(From the Journal des Sçavans.)

L I S B O N.

III. ORAÇON inaugural do Primerio Curso de Operacoens Cirurgicas, que publicamente fez con Permissao de sua Magestade fidelissima no Hospital Réal de Lisboa, Filippe Joseph de Govea, Cirurgico da Camera do Serenissimo Infante o Senhor D. Manoel, recitada ne ultimo de Janeiro, 1762. Or, An inaugural Dissertation on the First Course of Chirurgical Operations, which were publicly performed with Permission of his most faithful Majesty, in the Royal Hospital at Lisbon. By Mr. Philip Joseph de Govea, Surgeon in Ordinary to the most Serene Infant Don Emanuel, pronounced on the last day of January, 1762. Lisbon, printed for Anton. Rodriguez, in 8vo.

WE cannot expect any thing very edifying or important, from a country where medical knowledge has made so small a progress, and where its improvement is so little cultivated.

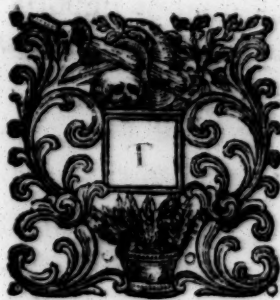


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Nº LX.

Observations on extraneous Bodies retained in the Oesophagus or Gullet ; together with Remarks on such Means as have hitherto been, or may for the future be employed to dislodge them, either by Depression or Retraction. By M. Hevin.

[Continued from p. 368.]



THE leek, which is easily found every where and at all seasons, is a very commodious and usual method of depressing extraneous bodies which are but little advanced in the Oesophagus : however some authors think it not altogether sure, because it may be bruised in bending to accommodate itself to the figure of the pharynx. The violent motions of the Oesophagus may also contribute to this inconvenience.

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FABRICIUS AB AQUAPENDENTE * prefers to all the other means we have mentioned, the wax-candle dipped in oil; but before we use it we are to warm it a little, in order to make it easily take the figure necessary to enter into the canal of the Oesophagus without violence: we ought particularly to take care of this circumstance in winter, during which season, the wax becoming soon hard, the candle will be so stiff as perhaps to wound the Oesophagus, and, by the irritations it might produce in that part, retard the success of the operation. The best method, therefore, of giving a due consistence and suppleness to the wax-candle is to soften it a little in warm water or oil.

ALBUCASIS †, in order to convey extraneous bodies into the stomach, made use of a piece of lead, which was thin enough to make it very flexible, and which in all probability must have had at its extremity a small button to press on the bodies lodged in the Oesophagus. Rhafus also made use of the same instrument.

VERDUC ‖ proposes a nearly similar instrument, made of silver or flexible steel, of the size of a quill, almost a foot and half long, and whose ends terminate in a button somewhat conoidal, and as large as a small nut.

FABRICIUS HILDANUS, as we have observed, on these occasions successfully used a large crooked silver probe; he also had recourse to other instruments, both to retract engaged bodies which only possessed a part of the canal of the Oesophagus, and to depress them to the stomach when they possessed the whole of it: he made use of one, the invention of which he ascribes to Gautier Herman Ryff, a celebrated phy-

* Operat. Chirurg. cap. 36.

† Chirur. franc. de d'Alechamp. chap. 32.

‖ Operat. Chirurg. cap. 25.

fician and surgeon at Strasbourg, and on which he himself made an improvement; but the great disadvantage of this instrument was, that it was made of an inflexible substance, whereas M. Petit, as we shall afterwards shew, has invented one which has all the advantages of the former, and several others, without having the defect now mentioned. We shall, in another part, have an opportunity of considering several other means which have been successfully employed in conveying to the stomach such extraneous bodies as are far advanced into the canal of the Oesophagus.

REMARKS ON CASE I.

THOUGH we are from daily experience convinced that the various extraneous bodies we have mentioned, may be conveyed to the stomach without producing any symptom, yet it is of great importance to advertise young surgeons that this method is not always the surest; for we find in the works of practical authors, that these bodies are sometimes retained either in the stomach or intestines, and produce a great many disorders and even death.

THERE are sometimes portions of aliments which pass easily into the stomach, and which being afterwards thrown up by vomiting, stick in the Oesophagus; this accident happens when these portions of aliments are of a spongy substance, which may be easily inflated. Hollerius * informs us, that a girl who had filled her stomach to excess of ox's lungs, was by that means afflicted with weight and heaviness about the epigastric region, with frequent nausea and at last a considerable vomiting, by means of which a portion of lungs she had eaten was thrust into the Oesophagus, where it stuck, and produced very terrible symptoms, till it was thrown up by the mouth with very violent efforts.

* Scholiogr. ad Cap. 33. lib. i. de Morbis internis.

WE may easily conceive that it would not have been proper, in this case, to have repelled the piece of lungs into the stomach, because perhaps it could not have been discharged through the pylorus, and because the patient would have been still exposed to the misfortune she then laboured under; for similar portions of aliments, though long retained in the stomach, cannot sometimes be expelled from it but by vomiting, and with a great deal of danger to the patient. The same author * evinces this fact by an observation which, on other accounts also, deserves a great deal of attention, because if these portions of aliments remain sometimes long in the stomach, they may by putrefying produce and maintain very troublesome disorders, the principle or cause of which is very difficultly discovered. A girl precipitately eat a large quantity of calf's lungs, after which she was seized with almost the same symptoms as the former, such as heaviness, anguish, weakness, and frequent inclinations to vomit: these symptoms continued for a long time; but what is particularly remarkable is, that the girl threw up in vomiting a piece of the calf's lungs which she had eat four months before; for she had eat none since that time. This portion of the lungs stuck in the Oesophagus, and was like to have suffocated the patient, but happily a violent effort disengaged it, and facilitated its discharge: we must therefore perceive that we can only rid the Oesophagus of such bodies safely by extraction.

SOMETIMES the portions of aliments which are retained in the Oesophagus or stomach, are not only dangerous by their bulk, but also in consequence of the bad qualities which in corrupting they acquire by their continuance in the first organs of digestion. Donatus † saw a certain case of this kind: A man greedily swallowed a piece of tendinous flesh, which stuck in his Oesophagus, and almost totally intercepted the passage

* Perocl. ad 8. lib. viii. Galen comp. Pharm. part.

† Hister. Mirab. lib. iii. cap. 8.

both of the air and of the most liquid aliments. This extraneous body could neither be retracted nor depressed by any means, but became corrupted, and at the end of seven days fell into the stomach; the patient was freed from his pain, but could not avoid death, which happened on the fourteenth day, and which was attributed to the inflammation and the long want of aliments, which brought on a total loss of strength; but the presence of the corrupted body probably contributed more to the extreme weakness and death than the want of aliment.

BODIES of a considerable bulk deserve a particular attention, when they are formed of such substances as can neither be absolutely dissolved nor digested in the stomach. Thus a surgeon, who should have been called in the two following cases, and should have depressed the bodies which stopped up the Oesophagus, and intercepted respiration, would have taken a step much less sure than if he had extracted the bodies. Habicot * was ordered by the court to visit a prisoner who was found dead in the keeper's apartment; this surgeon informs us that he found in the throat a large knot of linen which strongly pressed upon the epiglottis, and in which there was a ring.

THE other case is related by Meeckren †, who being called to inspect a woman thought to be poisoned, began to examine the parts of the mouth and throat by a speculum oris, and forthwith perceived a large portion of cork covered with silver; Meeckren knew that this body was an instrument commonly called an obturator of the palate. This woman had sustained a great loss of the substance of the palate, and had for a long time used this instrument: the cork had been apparently wore away or putrefied, and the instrument coming out of the hole fell into the throat, and so compressed the

* Question Chirurgicale sur la Bronchotomie, chap. 11.

† Obs. Med. Chirurg. cap. 22.

larynx, that it suffocated the patient before she could have any relief.

WE may easily perceive the danger there is in depressing bodies of this nature and of so considerable a bulk ; for we ought to be afraid lest, after having conveyed them to the stomach, they should not afterwards be discharged from it : in a word, there have been smaller bodies seen, which by being retained in the stomach have proved mortal.

KIRCHRINGIUS * informs us that a child of five years of age died by swallowing a very small coin, which totally closed up the pylorus. The same accident happened to another child, and produced the same effect. This child died after violent vomitings, and the coin was also found engaged in the pylorus †. Adults are also exposed to the same danger, as we find from various examples recorded by authors ‡.

IT seems surprizing, however, that a single piece of coin should produce so fatal effects, when we find in observators that a traveller, being afraid of robbers, swallowed six ducats without any symptoms, and a few days after discharged them by means of a clyster || ; that another, with as great ease, discharged nine louis d'ors which he had swallowed § ; and that two other persons, each of whom had swallowed an hundred louis d'ors, had only gripes or colics, which indeed were very violent, and lasted till these extraneous bodies were discharged, which was done gradually by means of clysters ††.

* In Spicileg. Anat. obs. 1.

† Ephem. Germ. cent. iii. & iv. obs. 121.

‡ Wedelius Boneti Med. Septentr. de Oesoph. Affect. lib. iii. sect. 1. cap. 9. Fab. Hild. Cent. obs. 35. Ephem. ann. iv. cent. x. obs. 82.

|| Mich. Mangeti Biblioth. Chirurg. de Deglut. Vitiis.

§ Ephem. cent. x. obs. 34.

†† Petr. Borei I. cent. iv. hist. 25. & Joh. Mich. Fehrius, in cent. iii. Epist. Med. Barth. 69.

THOUGH these facts are highly instructive and important, yet they seem generally to be most regarded when they happen to persons of note and distinction. The royal academy of inscriptions has not forgot to relate one of the same kind in the elogy of M. Vaillant, a physician and celebrated antiquarian: after having been taken by a pirate, and retained prisoner at Algiers for four months and half, this physician was, in returning to France, chased by another privateer of Tunis; on seeing this new misfortune, that he might not lose all, as he had done in the other vessel, he swallowed fifteen golden medals which he had about him. M. Vaillant however, having escaped the pursuit of the pirate, made it his business to find out the method of freeing his stomach from the burden he had committed to it. As nature did not seem disposed to afford him any relief, he began to think himself in danger, and consulted the faculty of medicine on his case: every physician proposed a different remedy, and the patient not knowing which of them to take, left himself intirely to the disposal of nature, who acted her part so well that she discharged half of them when he arrived at Lyons, where he sold them to a virtuoso, promising to let him have the rest as soon as he could; and, to his great satisfaction, he was able to fulfil his promise that very night.

It is, however, to be observed that hard bodies, though of a small bulk, may by their number, when collected into one place, become fatal: such was the collection of fruit-stones mentioned by Binnigerus *, who informs us that a man had a very hard tumor on the hypogastric region, complained continually of intense pains of the whole abdomen, felt frequent motions and rumblings in his intestines, and at last died, having only been able to use a little liquid aliment for three years. The observer, upon opening the body, found the colon sphacelated and open: this intestine was distended by a collection of the stones of plums and cherries, which

* Cent. ii. obs. 20.

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weighed more than three pounds. There were also found in this intestine forty leaden bullets, which the patient had swallowed at different times in hopes to be relieved. In the *Ephemerides* * we are told that a man died after a long constipation, occasioned by a collection of cherry-stones which he had swallowed some time before. Stalpart Vanderwiel † saw a man who, in a similar case, was more happy, since he had swallowed a large quantity of cherry-stones, which he did not discharge till six months after without feeling the least inconvenience from them.

WE know but little of the bad effects of musket bullets taken into the stomach: we read, however, in the German *Ephemerides* ‡, that a man, only by swallowing small shot, was afflicted with very intense pains of the stomach, like those incident to tradesmen who are daily employed in working lead, sometimes also similar to those produced by aliments or remedies in which litharge, sugar of lead, or any other preparation of lead are ingredients. These pains cannot be appeased by any remedies; however, there are few examples evincing that accidents happen similar to the case we have now related; for we have sometimes observed in the aperture of the bodies of such persons as had, during their lives, eat a great deal of venison and wild fowl, that a large quantity of small shot has been collected in the cellules of the intestines, and particularly in the appendix of the cœcum, though these persons never felt the least inconvenience from that circumstance. We can more easily comprehend the cause || of the symptoms which happened to a girl, who having cut several plates of lead into small portions, swallowed them, by which were produced violent pains in the region of the stomach,

* Myrrhen. dec. iii. ann. ix. & x. obs. 211.

† Cent. i. obs. 64.

‡ Ann. viii. cent. ix. obs. 23.

|| Obs. 5. lib. i. cap. 28.

weakness,

weakness, anguish, an obstinate constipation, and at last death. It is sufficiently obvious that the angular figure of the small portions of lead had a greater share in these disorders than the malignity of the metal.

RINGS, whose stones are full of sharp and rising angles, as also those rings that are made with rough and raised work, may fret and irritate the parts they touch, and by that means produce dreadful symptoms. Zacutus Lusitanus * informs us that a man in his frolics swallowed a gold ring of raised work, with a small engraved head; this ring produced an obstinate dysentery, which did not cease till the patient had discharged that extraneous body; though, during the whole time, oleous and lubricating medicines, assisted by some purgatives, had been frequently used †.

STALPART VANDERWIEL ‡ informs us that he had seen more terrible effects produced by a ring which stuck in the Oesophagus of a child of two years old: this accident was succeeded by an extreme difficulty of deglutition, anguish, and violent pains. The parents in vain made a great many attempts to retract the ring, but the symptoms continued, and the child died at the end of six weeks: upon opening it the ring was found engaged in the Oesophagus.

FROM these observations it is natural to conclude, that we ought as much as possible to endeavour to retract these extraneous bodies, whose bad effects we have seen; because, when we succeed in doing so, we are freed from all fears; whereas, when we convey them to the stomach, we are not absolutely sure of the event: neither ought we, in forming our judg-

* Lib. ii. de Medic. Princip. hist. 84.

† This fact is also related by Aëtius, Tetrab. iii. serm. i. cap. 46. and by Galen, lib. iii. de Facultat. Nat. 4.

‡ Cent. i. obs. 22.

ments in this last case, to forget the symptoms which these bodies may produce when they are conveyed into the stomach.

CASE II.

Of such extraneous Bodies as, when stopped in the Oesophagus, ought to be retracted.

IF those bodies which may be conveyed into the stomach with least danger, sometimes produce effects so troublesome as those we have mentioned, we ought much more to dread the disorders which may be excited by hard bodies which stop in the Oesophagus, and which by their angular, unequal, or cutting figures are capable of irritating, cutting, or lacerating the parts they touch; so that we cannot be too attentive to the danger there would be in clearing the Oesophagus by forcing such bodies into the stomach. We may to this class of extraneous bodies refer needles, pins, sharp stones of various fruits, irregular portions of glass or stone, fragments of steel, iron, or any other metal, thorns, ears of grain, large fish-bones, portions of bones, which may wound by their inequalities or points, and a great many other bodies of the same kind.

M. MESNIER was called to see a woman who in eating some soup had swallowed a splint of a bone of beef, about an inch long, as large as one's finger in the middle, sharp at both ends, and about half a finger-breadth in thickness: this portion of bone stuck in the right side of the pharynx, where it produced a violent pain. M. Mesnier tried to dislodge this bone by a piece of lead fixed to the extremity of a large wire, which he several times introduced into the Oesophagus; but all his efforts only procured such a removal of the bone as made the pain cease almost intirely, though there remained a certain painful titillation, which the patient felt for four months when she swallowed any aliment: this state was afterwards fol-
lowed

lowed by a continual fever, a difficulty of breathing, an intense pain all along the right side of the Oesophagus, and a kind of rattling of the air in the throat, so that she seemed to be in imminent danger. M. Mesnier bled the patient three times, and ordered her the remedies indicated in inflammations of the breast: when the symptoms were somewhat assuaged, she expectorated pus without coughing, and gradually recovered her health, only the rattling noise remained, together with a slight pain in the throat, but she easily swallowed all kinds of aliments. At last, after ten months were elapsed, she threw up the bone in coughing and sneezing with a great deal of violence. M. Mesnier saw this bone a very short time after its discharge, and informs us that it was corroded, ill-smelled, and as yet moist with the pus: he ordered the patient a deterfive gargism, which terminated the cure.

FABRICIUS HILDANUS * relates an observation, in which we find similar symptoms produced by a bone which stuck in the throat: several attempts were in vain made both to retract and convey it to the stomach; as it had many acute angles, it excited intense pain, with an inflammation of the neck, accompanied with a fever, a delirium, convulsions, and a very great difficulty of deglutition and respiration. All these symptoms were succeeded by an abscess of the throat; the bone was discharged with pus from the mouth on the seventh day, and the woman was cured. The same author † speaks of a man who was like to have been suffocated by a small, but pretty thick and triangular bone which he swallowed, and which stuck in the Oesophagus near the first vertebra of the back: this small bone excited violent pains, so that an attempt was made to disengage it from the Oesophagus by means of a leek, which did not succeed. Hildanus informs us that next day he retracted it with an instrument of his own invention, of which we shall speak by-and-bye.

* Cent. i. obs. 32.

† Cent. i. obs. 36.

OBSERVATORS have often remarked, that the bones which stick in the Oesophagus are at last disengaged, because the caries or putrefaction (as we have already seen p. 386, 387.) seizes these bones, and destroys the points which have entered into the flesh.

FABRICIUS AB AQUAPENDENTE * informs us that a great many attempts were made to retract a bone which stuck in the Oesophagus, but all to no purpose, because it was very much forked, and had strongly engaged itself by its points: this bone became moist, tender, and was at last broken into several pieces by the efforts which the woman made to expel it, and at last she threw the whole of it up in coughing.

WE are so exposed to this kind of extraneous bodies, that observators abound with examples which evince the danger arising from the presence of bones stopped in the Oesophagus. Gockel † gives us a frightful description of the terrible symptoms produced by a bone which a man had swallowed. We find in the same observator ‡ a case still more fatal, for it proved mortal to the patient. Another man, who had swallowed a pig's tooth, had a less cruel fate; but was for a long time reduced to a very deplorable condition: Bartholin, who relates this fact ||, says that the patient fell into a marasmus, and that, during the two years this bone remained in his body, he was tormented with violent pains of the hypochondria.

THE bones most subject to stick in the Oesophagus are those of fish, and when they are large, they often produce very fatal effects: of this we find a very memorable example in the

* Operat. Chirurg. cap. 39.

† Cent. i. conf. 30.

‡ Dec. v. obs. 6.

|| Ephemerid. dec. i. ann. ii. obs. 74.

Memoirs of the Royal Academy of Sciences *; and authors relate a great many observations which would prove the same thing, if it was necessary. We shall, however, give a few of them, to make people remark the different disorders which these bones may produce.

A WOMAN in eating some cod swallowed a pretty large bone, which passed into the throat, almost without causing any pain: she felt only for two days a little uneasy titillation when she swallowed solid aliments; but on the third day the pain became more violent, and was succeeded by a fever and a difficulty of swallowing even liquid aliments. Various venæ-sections, repeated one after another, in the first days did not hinder the progress of the symptoms, which only ended by a suppuration in the pharynx, which disengaged the extraneous body, and it was discharged from the mouth, with a considerable quantity of pus, on the seventh day.

DODONÆUS † also informs us that he has frequently seen very great inflammations and abscesses occasioned by fish-bones lodged in the canal of the Oesophagus. In Platerus ‡ we find a much more unfortunate case, which is that of a child, who in eating some carp swallowed some large bones, which stuck in one of the sides of the Oesophagus, and produced very intense pains with an inflammatory tumor, which suffocated the patient.

NEEDLES and pins appear less dangerous than the bones we have mentioned, because, being only sharp at one end, and formed of a ponderous substance, they in their motions naturally tend to turn themselves in such a manner that their biggest end is generally conveyed first into the Oesophagus by its weight: now when they take this determination, the parts

* Ann. 1716, p. 183.

† Observat. Medecin. cap. 17.

‡ Pr. tom. i. pag. 427.

through which they pass are but little exposed to be wounded by them; it even frequently happens that when their points are engaged, they produce almost no symptoms, especially when they are small, and when the parts in which they are lodged are but little sensible and incapable of resisting them. These small bodies, when very sharp and smooth, as we shall afterwards observe, make their way insensibly through the parts, especially in the texture of the fat, without producing pain or any other bad effect; but circumstances are not always so favourable.

A WOMAN swallowed two pins, which stopped in different parts of the Oesophagus and stomach: Wierus * informs us that this woman was afflicted with intense pains, gripes, and colics, and that the pins were some time after discharged by the anus. In the Acts of Berlin † we find the history of a very obstinate vomiting of blood, occasioned by pins which the patient had swallowed. Segerus ‡ mentions a young man who, to testify his love to a lady, swallowed three needles; this piece of folly cost him pretty dear; for the needles produced frequent faintings, which were sometimes accompanied with convulsive motions. It was a whole year before the patient discharged these extraneous bodies by stool, and was freed from the symptoms they produced. The same author informs us that a man who swallowed two large needles, had violent pains of the stomach, but that the needles were discharged by stool six days after.

NEEDLES and pins are more to be dreaded when very large; since in this case they often produce very formidable symptoms. Fabricius Hildanus || informs us that a young girl, who had inadvertently swallowed a pretty large pin, discharged

* Schenkii lib. iii. obs. 4.

† Vol. I. p. 53.

‡ Boneti Med. Sept. lib. iii. de Oesoph. Affect. sect. 1. cap. 8.

|| Cent. i. obs. 34.

it by stool on the fourteenth day: this pin remained for three days in the stomach without causing any disorder; but from the third day till its evacuation it produced insupportable pains about the region of the pylorus, succeeded by a burning fever, accompanied with a phrensy and terrible convulsions, which ceased not till the pin was discharged.

A YOUNG lady * of eighteen years of age carelessly swallowed some pins which she held in her mouth; some days after the accident she felt violent pains in several parts about the abdomen; some of these pins were evacuated by stool, and others, penetrating the intestines, were discharged from different parts of the abdomen: the pains were succeeded by a dysentery, accompanied with violent gripes, syncopes, and frequent convulsions. The lady was surprizingly extenuated, and died at the end of three weeks.

A NEEDLE which a man swallowed produced as fatal effects. Schenkus † informs us that it pierced by degrees through the membranes of the stomach, penetrated the proper substance of the liver, and made the patient die consumptive. Forestus ‡ relates the history of a girl whose fate was no better: she swallowed a large needle, which stuck in her throat; attempts were in vain made to retract it, so that the patient fell into a consumption, of which she died soon after.

WE find in the same author a fact which seems to have some relation to the former: he informs us || that a barber, upon examining a woman's throat with a probe, let the instrument fall into the Oesophagus. He made several fruitless attempts to retract it, but it fell into the stomach, and occasioned an excessive extenuation, which proved mortal two years afterwards.

* Bayle, Nouvelles de la Repub. des Lettres, Octobre 1685, article x.

† Nereti Nerutii, Med. Florent. Obs. Schenkii, lib. iii. obs. 10.

‡ Lib. xv. obs. 27.

|| Lib. xxv. schol. ad obs. 23.

IT now remains for us to give some examples of the fatal effects produced by various other kinds of extraneous bodies, such as sharp stones of fruits, fragments of pipes or glass, splinters of swords, pieces of wood, or knives. A child playing with nut-shells swallowed a few fragments of them, which suffocated it. Raigerus *, who relates this observation, also informs us that he saw the same accident happen to another child from a plum-stone; so that we need not be surprized to find in Schenkius † that the stone of a peach, which a man had swallowed, produced very considerable symptoms.

WE have many examples of the terrible consequences produced by pieces of tobacco-pipes which have broke in the mouth. A man smoking tobacco fell upon his face; his pipe broke, a piece of the stem stuck in the bottom of the Gullet, and produced a great hæmorrhage, succeeded by an inflammation and an external tumor, which suppurated under the ear. Muys ‡ opened the abscess, and found the piece of pipe which had occasioned all these symptoms. Stalpart Vanderwiel || preserved a piece of tobacco-pipe, about the third of a finger in length, which had occasioned the death of a man: he was smoking, it seems, and fell upon his face, like the other; the pipe broke, and a piece of it entered the muscles of the neck; several attempts were made to draw it out, but to no purpose; the fragment of the pipe excited a very acute pain, a tumor with inflammation, a violent fever, with great restlessness; all which put an end to the patient's life on the third day.

It is however to be observed, that in these two cases the violence with which these bodies were plunged into the flesh,

* Boneti Med. Sept. de Oesoph. Affect. lib. iii. sect. 1. cap. 74

† Lib. iii. obs. 4.

‡ Prax. Chirurg. Rational. decad. iii. obs. 6.

|| Cent. i. obs. 21.

and the wound which they made, must have been the principal cause of the terrible symptoms they produced.

M. HONDE has communicated to us an example of these extraneous bodies forcibly engaged in the throat and exciting pretty considerable symptoms, though not of any fatal consequence. A woman of sixty-six years of age, sitting on a three-legged stool and unravelling a spindle, fell with the stool while she had the spindle at her mouth; falling on her face, the spindle broke, and one of its ends entered with violence into the bottom of the throat, and penetrated very far into the muscles of the neck: the wound produced by this extraneous body was succeeded by a slight hæmorrhage; the patient forthwith felt very acute pains, and breathed with much difficulty, for which reason she was conveyed to the hospital. M. Honde examined the throat, where he discovered a very small wound, which still bled, but could not perceive the extraneous body: the patient, who could not then speak, made him understand by signs that a fragment of the spindle had entered the neck in the back part of the throat. The surgeon, on touching the hinder part of the neck, perceived the extraneous body under the teguments, in the middle part of the neck and left lateral part of the third vertebra, counting from below upwards. The symptoms, which were pressing, determined him to extract the portion of spindle with all expedition; accordingly he called a consultation of several surgeons, in their presence made a longitudinal incision, and discovered the extraneous body, which he extracted with his pincers: he laid hold of it by a small hook of brass wire which was at the end of the spindle, and had first penetrated into the flesh. This extraneous body, joined with the iron wire, was three inches in length. As soon as the operation was performed, the pain was considerably diminished, the respiration became much freer, the patient recovered the use of her speech, and the incision was dressed as a simple wound. M. Honde had the patient several times bled, and prescribed a deterfive vulne-

rary gargarism: neither a fever nor any other symptom supervened; the divided fibres of the muscles of the neck were brought into contact, and the patient was cured of both wounds in eight days.

WE may easily conceive that fragments of glass or other bodies of the same kind, which are of an irregular figure, cannot be swallowed without danger. Cardan *, Bartholin †, Francus de Frankenau ‡, Cæsalpinus §, Platerus §, and others, give us various observations concerning disorders produced by swallowing pieces of glass: these bodies are so pernicious, that pulverized diamonds, commonly called the powder of succession, is looked upon as one of the rankest poisons, and is said gradually to tear and corrode the parts it touches by the cutting inequalities of its particles. The same malignity is ascribed to crystal, and even to common glass.

IN Fabricius Hildanus ** we are informed that some of the king's guards, after a great debauch of wine, bruised their glasses with their teeth, swallowed the fragments, and all died soon after. Cardan †† informs us that a foolish woman mixed powdered glass with peas, and that two persons who eat of it became dropsical. The same author ††† says that he has seen several nuns who had eat glass, and by that means died after the most terrible symptoms. Zacutus Lusitanus †† informs

* Lib. ii. Contradiſtion. Med. tr. v. contrad. 9.

† Cent. v. hiſt. 66.

‡ Satyr. Med. ſatyr. xvi. de Hyalophagis, p. 302. 322, 323.

§ Lib. iii. cap. 29. apud Zacchiam.

§ Pr. tom. ii. cap. 11.

** Mangeti Biblioth. Chirurg. de Ventric. Morb. tom. iv. p. 123.

†† Contr. Med. lib. ii. tr. v. contr. 10.

††† Lib. i. de Venen. cap. 1.

†† Prax. Admir. lib. ii. obſ. 12.

us that a man who had swallowed three rough diamonds died hectic, after a very obstinate dysenteric flux.

THE reader will perhaps be surprized at our giving some examples of the disorders which may be produced by pieces of sword-blades, knives, and other similar instruments, when swallowed: but though we do not relate such observations with a design to shew that such instruments received internally are dangerous, yet we judge them proper to point out the various symptoms which so hurtful bodies may produce, and to describe them such as they really were. Besides, these observations may make young surgeons sensible how much they ought to be on their guard against a multitude of relations, where it is said that similar bodies have been swallowed without having produced any symptoms: in short, they will perceive by the observations we are about to relate, that though these histories were true, yet they ought never to make them overlook the dangerous circumstances of persons who have swallowed such pernicious instruments.

A MANIAC voluntarily swallowed several extraneous bodies, and among others, nails, pieces of wood, flints, and splinters of knives, which he bruised between his teeth: after some time he began to feel very acute pains and agonies in all the internal parts; these symptoms were succeeded by a spitting of blood, a difficult respiration, and a very ardent fever. Among other ailments, he felt a very intense pain in the right groin, where was a very apparent external tumor. At last he died of a marasmus, after a very long diarrhœa. Rothius * says that the patient himself had ordered in sport, that his body should be opened after his death; and when his orders were executed, all the viscera of the abdomen were found in suppuration; there was in the right groin, at the beginning of the colon, a large collection of pus and a fragment of the

* Miscellan. Curios. ann. 1672, obs. 179.

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blade of a knife, a longer and sharper portion of which was also found in the rectum near the anus *.

LANGIUS † relates that a peasant, who had swallowed an oblong and pointed piece of wood, four splinters of a blade of a knife, and two sharp and denticulated portions of iron of an irregular figure, was tormented with such cruel pains in the hypochondria, as to tempt him to kill himself: upon opening him these extraneous bodies were found in his stomach.

It is not surprizing that such a number of so hurtful instruments should occasion so violent torments, since it is certain that one alone may prove mortal. Walruts ‡ says, that upon opening the body of a woman to discover the cause of her death, there was found in her stomach a knife with a blade four inches long, which had pierced the stomach about three finger-breadths from its superior orifice, the point coming an inch and half out of the aperture it had made.

WE shall afterwards have occasion to relate many examples of knives, scissars, pieces of swords, and other similar instruments, which have been swallowed, and afterwards made vent for themselves in different parts of the abdomen.

[To be continued in our next.]

* This observation is also related by Burkhardus, *Miscell. Curios. an.* 1672, obs. 178. and by Binpingerus, cent. v. obs. 7. It is also related very circumstantially in Konig. *Boneti Med. Sept. de imo Ventre*, lib. iii. sect. 1. cap. 17. and in *Boneti Sepulchretum Anatomicum Pract.* lib. iii. sect. 14.

† Lib. i. epist. 38.

‡ *Ephemerid.* cent. ix. and x. p. 152.

Nº LXI.

To the Authors of the MEDICAL MUSEUM.

[The gentleman who transmitted the following abstract will pardon us for omitting the compliments which he says are paid to the plan of our work by many of the learned gentlemen of the faculty in Paris. It is our ambition, as it will be our endeavour, to merit their further approbation.

It may be sufficient in this place to inform the Public, that the preparation of Opium here recommended is in much estimation in many parts of Europe, and has been approved by the gentlemen of the faculty in Paris, as being a medicine retaining all the good qualities, and divested of many of the bad ones, which commonly attend the more vulgar forms of administering that important drug: and as it has not yet been used in England, we think ourselves happy in this opportunity of being the means of the introduction here of a curious and valuable acquisition to pharmacy.]

Extract of Opium prepared by long Digestion.

THE main design in preparing this Extract is to preserve only the gummy and extractive part of the Opium, deprived of all its oily and resinous substances.

CUT four pounds of good Opium into slices, boil it in twelve or fifteen quarts of water for about half an hour; strain it by expression, and boil the residue in new water once or twice, until it be dissolved; mix all these liquors together, strain them in a flannel, and evaporate them to about six pints, which put into a tin cucurbit sufficiently large; then commit them to a sand heat for six months or three months, night and day; take care to rake now-and-then the bottom of the vessel with a wooden spatula, because the resin begins
soon

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soon to fall to the bottom, as likewise to pour in fresh water in proportion as it evaporates : the heat must be sufficiently strong to keep it in a degree next to boiling.

THE vessel that is to be made use of ought to be of two inches and an half diameter, from which there evaporate about twenty-four ounces of water per day ; during the whole operation there evaporate about one hundred and forty quarts of water : when the digestion is finished, and the liquor cold, pass it through a flannel to separate the sediment that is formed therein during the digestion ; this must be washed with water in order to obtain all its extractible parts ; and you must evaporate all to a consistence sufficient to be formed into pills.

THIS is a most excellent anodyne, divested of the virulent narcotic quality and disagreeable smell of common Opium.

REMARKS on the Extract of Opium prepared by long Digestion.

OPIMUM is composed of a gummy substance, a resinous matter, an essential salt, and a thick essential oil ; such are at least the substances that manifest themselves during the digestion, and such are the products that result from its decomposition ; the essential oil of Opium has a consistency not unlike that of butter semi-fixate ; it is not at all volatile in this state, at least I have remarked that it did not rise by distillation as the essential oils that are extracted from other vegetables, yet it becomes attenuated and subtilised by digestion, and a great part is thereby rendered volatile : one would be induced to believe that the flexibility of its resinous matter is derived from the oil it contains, and that it serves as an intermedium to unite together all the different principles that constitute the substance of Opium. After three or four days digestion this oil, which is produced by the decomposition of the resin, begins

gins to float on the surface of the liquor, and to form thereon by the cold a fatty, resinous covering, which sticks to the fingers somewhat like turpentine; it is about the thickness of a shilling, and of a grey or ash colour, and does not disappear until towards the first month of the digestion; but it always leaves behind some clouds until the third month; this proceeds from those particles of the resin that separate themselves the last from the gummy substance: those oily clouds disappear intirely, except when the liquor is hot, whereas they appeared before as well cold as when hot; the resinous substance of the Opium loses likewise its fluidity, quits the gummy substance, dries apace, and decomposes itself intirely. This resin sticks in the beginning to the bottom of the vessel when it becomes cold, during the night; but as soon as the vessel is heated, it leaves immediately the bottom; it preserves, during a long time, the form of a resin, grows soft by the heat, is apt to crumble, and falls to powder when cold: this friability is by so much the greater as the digestion is the farther advanced; but towards the latter end it loses its coherency, and remains in powder, nor re-unites into a mass, having undergone a total decomposition.

ONE may suppose with some appearance of reason, that the smell and narcotic quality of the Opium reside chiefly in its oily and resinous principles, since, in proportion as those principles separate one from the other, the Opium loses its virulent and nauseous smell and its narcotic power, retaining only its more lenient, anodyne property, and occasions no more those deliriums that are very often produced by the crude Opium.

IN fine, when the digestion is finished the liquor has no taste that approaches to that of Opium; in this state its taste somewhat resembles that of any inodorous and insipid vegetables when half boiled.

IT

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IT is of no great consequence whether the liquor boils or not during the digestion, provided the ebullition be not too strong, and that care be taken to fill the vessel in proportion as the water evaporates: however, if the liquor is kept in a boiling state, the operation is sooner accomplished by nearly two months.

ONE may separate at pleasure the depositum in proportion as it forms itself; but I have always remarked it to be needless to do that, it being sufficient to separate it when the operation is finished, as in the above-mentioned manner. When the liquor is filtrated, if it be reduced to a pint by evaporation, it will deposit, by means of the cold, in one day a large quantity of salino-terrestrious matter, redish in colour, not very different from the sal sedativus in appearance, and amongst which are found small crystals resembling the figure of needles. I have extracted but one drachm of this salt from four ounces of Opium, though I could have obtained much more.

HAVING had the curiosity to weigh the different products of the four pounds of Opium which I had made use of, I found the following account; viz.

	℔	ʒ	ʒ
Residue remaining in the linen and perfectly dry	1	1	0
Resin precipitated during the digestion — —	0	12	0
Extract thickened to a consistence fit to make pills	1	15	0
Essential salt of Opium — — — —	0	0	1
	3	12	1
Volatile substances that disappeared — —	0	3	7
	4	0	0

I HAVE

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I HAVE performed this operation very often, and have generally found the same quantities. Below are the quantities of the extract of Opium which I have obtained after digestion during intervals of different times;

		Dose of Opium.		Extract obtained.			Digestion.
		lb	3	lb	3	3	Months.
March	6, 1749,	2	0	0	11	4	4
July	8, 1749,	2	8	1	1	0	5
November	24, 1749,	3	0	1	8	0	2
January	16, 1750,	5	0	2	3	0	4
September	4, 1750,	4	0	1	15	0	4
March	1, 1761,	3	0	0	0	0	6

It is evident from these observations, that the Opium which had digested during two months, was far from being as good as what had digested for a longer time; and in fine, that what had digested five months, and even six, was the best of all.

A succinct Examination of the different Depositums separated from Opium.

THE residue remaining on the cloth after the decoction of the Opium was a mixture of ligneous, vegetable substances; which yielded but a slight tincture to spirit of wine. The depositum formed during the digestion is under two different states; it is, as remarked above, the resin of Opium decomposed; one part is in powder, dry, and friable; this is the part that was the first precipitated, and is intirely decomposed, and yields nothing either in water or the spir s of wine: the other part of this resin is in lumps, and was precipitated the last; it is but half decomposed, dissolves in a great measure in spirit of wine, and furnishes a tincture pretty well charged, which whitens when mixed with water.

Observations on the Medicinal Use of the Extract of Opium thus prepared.

A CERTAIN lady of distinction being attacked with convulsive motions of the stomach and continual vomitings, put herself under the care of M—— D——, physician, of the faculty of Paris, who, after many remedies suitable in such cases, prescribed for her the ordinary extract of Opium to the dose of a grain a day; after a certain time she increased it to grains per diem, but obtained no sensible benefit from this remedy; it even augmented her vomitings and convulsions of the stomach to such a degree, as to reduce the patient to the lowest ebb: the physician then prevailed upon her to take of the extract of Opium prepared by digestion, which had the desired effect. He augmented the dose in proportion as she became more accustomed to the remedy, and so raised it to fifty grains per diem, which dose she continued for several years, at the end of which she found herself perfectly well.

IT will not be perhaps out of the way to relate here some observations on the different circumstances wherein the patient found herself during the continuance of this remedy, and what were the effects that she experienced from the ordinary Opium, to which she had been obliged to return, because the little quantity prepared by digestion lasted but three or four months. She was taking thirty grains of it per diem at this time: she returned to the use of the ordinary Opium; but as she dreaded the consequences of the common preparation of it, the physician administered it to her in but very small doses; yet she found herself always, a few hours after taking the dose, in the same way that she had been before she began to take the Opium prepared by digestion; this induced the physician to make use of several preparations of Opium, such as the laudanum liquidum Sydenhami, and different tinctures of Opium, because he perceived there was

nothing but Opium that could calm those violent convulsions and vomitings: at other times he made her take the extract of Opium boiled in a great quantity of water for fifteen days; imagining that this strong and continued boiling would answer the end of the digestion; but he found himself greatly deceived; the difference was, that though she vomited somewhat less, yet in general she reaped no great or lasting relief from this medicine. He undertook to mix this extract of Opium that had been thus prepared by long boiling with the oil of tartar, expecting that the fixed alcali would form a soap with the narcotic oil of the Opium, and that it would diminish its bad qualities: at length he ordered her to take the extract of the white poppies, believing they could not have the same inconveniencies as the Opium; but he soon found they would not answer; for the vomitings that followed were as great as those which had followed the pure Opium: the nature of the disorder was such, that it made the patient suffer most violently, and her pains augmented in proportion as the physician administered his remedy. Thus having served as an experiment in taking those different preparations of Opium, she found that the only one that was suitable in her case was the extract by the long digestion.

THESE observations, so very interesting in physic and pharmacy, are very proper to shew the absolute necessity we lie under of preparing such important remedies as these in the same manner; the direful effects that the patient experienced from the least change, demonstrates evidently what I here advance.

N° LXII.

An Account of a remarkable Operation on a broken Arm. By Mr. Charles White, Surgeon at Manchester.

ROBERT ELLIOT of Eyam in Derbyshire, a very healthy boy of nine years of age, had the misfortune, about Midsummer in the year 1759, by a fall to fracture the humerus near the middle of the bone: he was immediately taken to a bone-setter in that neighbourhood, who applied a bandage and splints to his Arm, and treated him as properly, I suppose, as he was capable of for two or three months; his endeavours, however, were by no means productive of the desired effect, the bones not being at all united. A surgeon of eminence in Bakewell was afterwards called in; but as he soon found he could be of no service to him, and, as the case was very curious, he advised the lad's friends to send him to the infirmary at Manchester: he was accordingly brought thither the Christmas following, and admitted an in-patient. Upon examination we found it to have been a simple, oblique fracture, and that the ends of the bone rode over each other: his Arm was become not only intirely useless, but even a burden to him, and not likely to be otherwise, as there was little probability that it would ever unite, it being now near six months since the accident happened.

AMPUTATION was therefore proposed as the only method of relief; but I could not give my consent to that; for as the boy was young and had a good constitution, it was hardly possible that it could be owing to any fault in the solids or fluids, but that either nature was disappointed in her work by frequent friction while the callus was forming, or rather that the oblique ends of the bone being sharp had divided a part of a muscle, and some portion of it had probably infi-

puated

suated itself betwixt the two ends of the bone, preventing their union : which ever of these might be the case, I was of opinion that he might be relieved by the following operation ; viz. To make a longitudinal incision down to the bone to bring out one of the ends of it (which might be done with great ease, as the Arm was very flexible) and cut off the oblique end, either by the saw or cutting pincers ; then to bring out the other end of the bone, and cut off that likewise ; afterwards to replace them end to end, and then treat it intirely as a compound fracture,

THE objections made by the other gentlemen concerned to this proposal were, first, The danger of wounding the humeral artery by the knife ; 2dly, The laceration of the artery by bringing out the ends of the bones ; and, 3dly, That we had no authority for such an operation. As to the first, that was easily obviated by making the incision on the side of the Arm opposite to the humeral artery ; the place of election appeared to me to be at the external and lower edge of the deltoid muscle, as the fracture was very near to the insertion of that muscle into the humerus, the danger of wounding the vessel not only being by that means avoided, but after the operation, while the patient was confined to his bed, the matter would be prevented from lodging, and the wound be easily come at to renew the dressings. The second objection will not appear to be very great, when we consider, that in compound fractures the bone is frequently thrust with great violence through the integuments, and seldom attended with the laceration of any considerable artery ; and as this would be done with great care and caution, that danger would appear very trifling. The third and last objection is no more than a general one to all improvements.

THIS method which I have been proposing was at last resolved upon, and I assisted in the operation, which was performed by a gentleman of great abilities in his profession on the

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the third of January in the present year: the patient did not lose above a spoonful of blood in the operation, though the tourniquet was not made use of. When the operation and dressing were finished, the limb was placed in a fracture-box contrived on purpose, the lad confined to his bed, and the rest of the treatment nothing different from that of a compound fracture.

THE wound was nearly healed in a fortnight's time, when an erysipelas came on, and spread itself all over the Arm, attended with some degree of swelling; this by fomentations and the antiphlogistic method soon went off, and the cure proceeded happily without any other interruption. In about six weeks after the operation the callus began to form, and is now grown quite firm; that Arm is as long as the other, but somewhat smaller by such long-continued bandage; he daily acquires strength in it, and will soon be fit to be discharged.

Manchester,
March 17, 1760.

C. WHITE,
Surgeon to the infirmary at Manchester.

N° LXIII.

An Account of a Case of a luxated Thigh-bone reduced. By Mr. Charles Young, Surgeon at Plymouth.

AS John Down, a middle-sized man, about forty years of age, was on the twenty-first of August 1759 harnessing his master's horses, they suddenly took fright, and ran away with the chaise, the wheel of which, as it rolled very swiftly along, struck him on the upper and hinder part of his right thigh: he fell to the ground, was unable to rise again, and complained immediately of a violent pain in his right hip. I came to him soon after the accident, and caused him to be put
to

Hyoscyamus Niger.



Black Henbane.

Medical Museum.

THE HISTORY OF THE UNITED STATES

OF THE UNITED STATES OF AMERICA
FROM THE FIRST SETTLEMENTS
TO THE PRESENT TIME
BY
JAMES M. SMITH

VOLUME I
FROM THE FIRST SETTLEMENTS
TO THE END OF THE SEVENTEENTH CENTURY

NEW YORK
PUBLISHED BY
J. B. LIPPINCOTT & CO.

1884

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PRINTED BY
J. B. LIPPINCOTT & CO.

NEW YORK

to bed, when on examination I found his only complaint was the violent pain about the articulation of the femur with the ischium, which was increased by any, even the least motion of the limb; the toe was turned in towards the heel of the left foot, and the heel of course outwards, and the whole limb, from the head of the femur to the toe's end, distorted in proportion.

I THOUGHT it was very evident at first sight, that there must be either a fracture of the femur, or a dislocation of its articulation with the ischium; the former, I think, would have been easily discoverable; but as by laying my hand on the great trochanter, while an assistant turned the foot inward and outward alternately, I could perceive that the motion of the great trochanter corresponded exactly to the bone; and, had this been the case, I expected to have been able to discover it by the grating that is always to be felt, when the two broken ends of a bone are moved one against another: but no such thing being perceivable, and yet the limb so much distorted, and the pain so violent and confined to the parts about the joint, I took it for granted, and pronounced the case to be a dislocation of the femur, and consequently endeavoured to reduce it by the usual method of extension; to this end two men extended the limb by pulling on napkins tied round the ankle, while others counteracted them by pulling on a sheet passed between his legs, and secured at the bed's head, turning the foot outwards as they made the extension. This gave him great pain; but the limb soon became in every respect parallel to the other; it appeared as long, and on laying it down on the bed the great toes and heels of both feet lay exactly in the same position, and the only difference which I could perceive in the two limbs was, that there was a little flatness about the hip of the right side; in short, the difference between the two limbs was so little, that I began to think I had been mistaken in my opinion of a dislocation (for it was evident there was no reduction made by the extension, for that
could

could not but have been perceived both by the patient and myself) and that the distortion of the limb was owing to nothing else than an involuntary contraction of the muscles, occasioned by the violence of the blow; I therefore bled him, confined him to lie on his back, and charged him to move as little as possible, imagining that rest would be his most effectual remedy. He continued in much pain for some days; but by degrees grew tolerably easy, except when the limb was moved; and at about twelve days after the accident he could suffer the limb to be lifted to and fro gently with little or no pain at all; notwithstanding which he could no more lift it of himself than at first, when it was much more painful: this embarrassed me a good deal. I was convinced there was no fracture of the limb in any part; and I thought from the circumstances above related, there could hardly be a dislocation; I therefore desired the opinion of two other surgeons, who, on seeing the position of the limb, and inquiring into all the circumstances which did and had attended it, agreed with me in opinion, that it was no fracture, and that it was equally unlikely under these circumstances there should be any dislocation; for the right leg, when placed by the side of the other leg, as I have said already, was exactly parallel to it, and continued so, unless the patient, either when asleep, or at any other time, moved his body so as to drag his leg; in that case the toe was always found inclining inwards and the heel outwards; but never so but that it might be replaced without the least difficulty or pain to him; but just so as one might have done by a limb that was paralytic: we therefore recommended rest, hoping that farther rest and time would recover the perfect ease and strength of the limb; but some days passing without any alteration, I gave him a strong purgative, and repeated it every other or every third day for several times, in order to reduce the muscles, that I might the more plainly feel any thing through them; for though he was in point of height but middle-sized, he was pretty fleshy, and the glutæi muscles consequently too thick to suffer any thing to be felt with any degree

degree of distinctness through them: this answered my expectation fully; for by repeating the purgative often, and at short intervals, his living sparingly, and being confined to his bed, he became much emaciated, insomuch that the head of the femur was plainly felt through the muscles dislocated backward, and lying in the space between the os ischium and os sacrum. Of this I acquainted the gentlemen who had examined it before, and desired them to examine it a second time, which they did on the fifteenth of September, and were immediately convinced that the os femoris was dislocated, and that it was the head of the bone we felt through the glutæi muscles in the space between the ischium and sacrum.

To the head of the bone's lying in this space it was probably owing that we were at first deceived, since its being there allowed a greater latitude of motion than could possibly have been the case any where else; which may serve to account for the parallelism of the limb to that of the other, notwithstanding a luxation.

BUT on turning the foot inward and outward by turns, while an assistant laid his hand on the head of the bone, a grating was perceived both by the patient and us all; this somewhat surprized us at first; but as this grating was never to be perceived without pressing pretty hardly on the head of the bone at the time the limb was turned round, and as the head of the bone was plainly felt to turn round whenever the thigh had that motion given to it, we concluded it could be nothing but the side of the head of the femur against the edge of the ischium.

CONVINCED of this, we determined to make an extension, and to that end brought him to the foot of the bed, and placed him on his back with the bedpost between his thighs, which was wrapped round with cloths to prevent its galling him; a napkin was tied round his leg at the ankle, which two assistants pulled on, while a third turned the knee outward,

and I had my hand on the head of the bone, pressing it downwards: as soon as the extension began, I perceived plainly the bone sink under my hand, which I had hardly time to say before it gave a snap, which was felt by the patient, and heard by us all, and the bone was reduced.

WHEN he was laid on his back in the bed, the right leg appeared somewhat longer than the other; but that might possibly be owing to the muscles not immediately overcoming the effect of the extension sufficiently to draw the head of the femur to the bottom of the acetabulum. In about six or seven days he was easy, and able to walk over the room with crutches, and bear a considerable weight of his body on the right leg; and from this time he recovered strength very fast, is now, and has long been, as strong in that leg and thigh as in the other, without any, even the least difference in length, or any other respect.

To Dr. HUXHAM.

S I R,

Plymouth.

I HAVE sent you the above case of John Down, because I know it is asserted by some surgeons, and among those of the greatest character too, that a luxation of the head of the femur is little less than impossible, and that what is generally taken for a luxation of this joint is a fracture of the bone at its neck: a fracture of the neck of the bone probably happens more often than a dislocation; but the above case has convinced me that it may happen, and that without any extraordinary violence, provided the force is aptly applied. Indeed, any force applied in the direction of the thigh downwards can hardly have any tendency to dislocate it at all, and any force from below upwards will be sustained by the head of the femur bearing against the upper part of the acetabulum, till the neck, the weakest part, gives way.

BUT,

BUT, though it may not be possible that the femur should be luxated by any force applied in a direction parallel to that of the thigh, in an erect posture of the body, it is not equally impossible it should be dislocated by a force applied in a contrary direction; for in the above case the blow was received on the upper and hinder part of the thigh in a direction forward, from the wheel of the chaise, which must necessarily have a tendency to drive it round forward, and consequently cant the head of the femur out of the acetabulum backwards, where it is less deep than it is either above or below on the fore part of the acetabulum; it is yet more shallow, and therefore less force is required to dislocate it that way, and more especially as there is on that side less strength of muscles to resist.

IT was probably a fortunate circumstance of this man that I thought myself mistaken in my first opinion of its being a dislocation; for had that been clearly the case, I should, no doubt, have used every method and every assistance to be had, in order to have reduced it immediately, and, most likely, while the muscles remained in their full strength, contracting involuntarily, and that violently too (as they will sometimes do upon attempting an extension of them, and under which circumstance the muscular fibres oftentimes rather break than give way) should have failed of being able to reduce it; and in that case the man must have remained a cripple as long as he lived; whereas now, though five-and-twenty days from the time of the accident, the muscles were so much weakened by his being confined to his bed, and wasted by his frequently repeating purges, that they very easily gave way, and the reduction was effected with as little difficulty as ever I saw in a dislocation of the humerus.

MIGHT not the giving strong purgatives, and frequently repeating them, so as to render the muscles of strong muscular subjects more lax and weak, be a means of reducing luxa-

tions of the humerus, which are not reducible by any method of extension, which is often found the case?

I am, S I R,

Your very humble Servant,

CHARLES YOUNG.

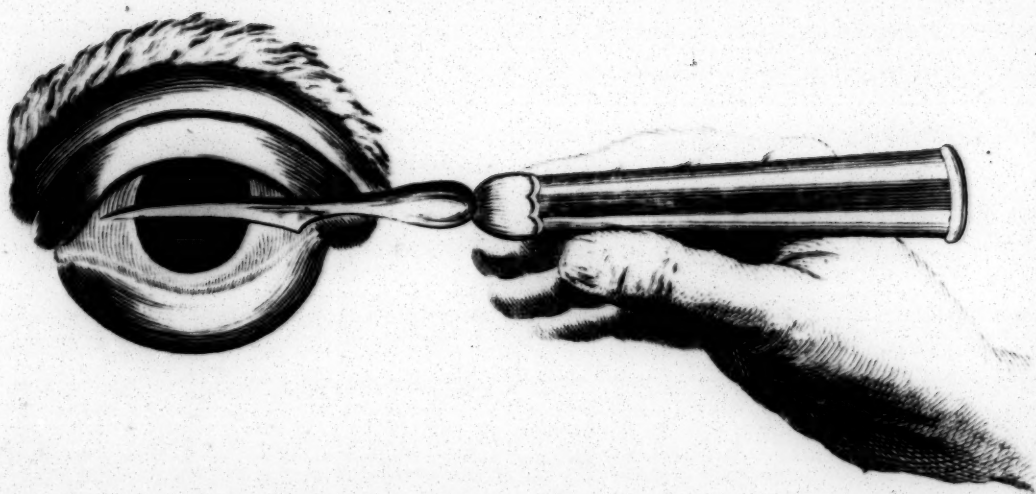
Nº LXIV.

Extract of a new Method of opening the Cornea, in order to extract the Crystalline Humour for the Cure of a Cataract. By Mr. Samuel Sharp, Surgeon, and F. R. S,

THE operation of discharging the crystalline humour from the eye for the cure of that species of blindness called a Cataract, was a few years since invented by M. Daviel (see p. 157, &c.) who has performed it on great numbers of patients, and continues still to practise it with remarkable success, as I have lately learned from the unquestionable authority of M. Morand, perpetual secretary of the royal academy of surgery at Paris; I here propose a method of making the incision of the Cornea, by which I flatter myself the operation will be very much shortened, the patient suffer less pain, and every skilful operator will be equal to the undertaking.

PLACE the patient in the same situation as for couching, either opening the eye-lids with your fore finger and thumb, or letting an assistant raise the upper eye-lid, whilst you yourself keep down the under one; then with a small knife (see Plate V.) holding the edge downwards, make a puncture through the Cornea near its circumference, into the anterior chamber of the eye, in such a direction as to carry it horizontally,

Plate. V



113 134 135 136 137 138 139

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izontally, and opposite to the transverse diameter of the pupil; after which you are to pass it towards the nose, through the Cornea, from within outwards, as near to the circumference as in the first puncture.

WHEN we have made the second puncture, push the extremity of the blade one seventh of an inch beyond the surface of the Cornea, and immediately cut the Cornea downwards, drawing the knife towards you as you make the incision; after this you press gently with your thumb against the inferior part of the globe of the eye, in order to expel the cataract, and the operation finishes according the different circumstances.

ONE extraordinary benefit seems to arise from the use of this single instrument, and perhaps from the shape of its blade, which increases in breadth all the way towards the handle; for by these means the punctures are so exactly filled up by the blade, that very little of the aqueous humour is discharged before you begin to make the incision, and consequently during this time the Cornea preserves its convexity; whereas by using one instrument to puncture, and others to dilate, the Cornea immediately becomes flaccid upon the issue of the aqueous humour, and renders the operation tedious and embarrassing, as I myself have found by experience in one patient, on whom I performed the incision of the Cornea with a pair of scissars, as recommended by M. Daviel.

S. SHARP.

An Account of an extraordinary Case of a Lady who
swallowed Euphorbium. By Dr. Willis of Lincoln.

IN December 1758, Mrs. Willis of Lincoln fell into a slow fever, occasioned by too small a discharge of the lochia after lying-in, and a redundancy of milk, the consequence of her not suckling her child.

On the eighteenth day after her delivery, by the mistake of her nurse, she took, instead of a draught that was ordered for her, two ounces of the tincture of Euphorbium *; the shocking symptoms which immediately ensued, violent suffocation, and an intolerable burning pain in the mouth, throat, and stomach, soon discovered the horrible mistake: I was in the room in about four or five minutes after the accident happened, unapprized of the nature of it, and therefore the more shocked, when I found every body in tears of despair, offering at no means of relief, as they had no hopes of success.

As soon as I was made acquainted with what had happened, it occurred to me that warm water and oil were the likeliest things to correct and expel the poison; I imagined a large quantity of warm water might probably make the patient vomit, and in some measure help to discharge the caustic tincture; I was sure the water would at the same time mitigate its violence by diluting it, and by precipitating the acrid gum from the spirit, whereby it would necessarily be hindered from touching the membranes of the stomach and bowels in so many points, and from penetrating into their substance.

* The tincture was thus much;

R. Gum. Euphorb. dr. ij. sp. vin. rect. unc. ij. sol. add. camph. dr. ij.

The camphor was ordered to weaken the caustic quality of the tincture, which being applied to a horse's leg without the camphor, had made a blemish.

THERE was happily a large tea-kettle of water on the fire, of which, being first qualified with a proper quantity of cold water, I immediately gave the patient a basin lukewarm, and repeated it as fast as possible, conjuring her to use her utmost resolution to swallow, which she certainly did in a most surprising manner: after the third basin she vomited very freely, what she brought up smelt very strong of the camphor, and seemed to contain a good deal of the tincture, with the gum separated from the spirit; she still drank on, but complained of excessive burning and torture in her stomach, crying out continually, she was burnt to death.

I HAD then recourse to oil between whiles, in the quantity of two or three ounces at a time, and drenched her plentifully, sometimes with oil and sometimes with water; she vomited very copiously, and I repeated the oil and water interchangeably till she had taken, as well as I could guess by the vessels, two gallons of water and a flask of oil in a very short time *.

IMAGINING

* Dr. Sydenham being called to a man who had taken mercur. sublim. corros. about an hour before the doctor saw him, the poison having affected his lips, &c. only ordered water to be taken in a large quantity, and thrown up copiously in glisters; but as the corrosive sublimate of mercury is to be considered as a poison, whose caustic acrimony consists in a saline principle, and water is the proper solvent, diluent, and vehicle of all saline substances, the propriety of Sydenham's ordering water alone is sufficiently apparent. Poisons of a saline nature being dissolved in the fluids of the stomach and intestines, do not confine their ravages to these parts only, but are apt to enter the absorbent vessels, and insinuate themselves into the road of the circulation; water is here a good antidote, as it dilutes such substances, washes them off the sensible membranes, destroys their acrimony, and readily passing through all sorts of canals, soon carries them out of the body. But the case is otherwise with gummy, resinous poisons, such as Euphorbium; these being indissoluble in water, are not so apt to enter the absorbent vessels, and pass into the blood, but by their acrimony shut up the orifices of those canals, and preclude a passage; therefore oil here should be called in to the assistance of water; for the caustic, resinous substance of Euphorbium being precipitated or separated from the spirit, and formed into slots by the water, would still be apt to stick to the tender nervous membranes of the stomach and bowels, and by its intolerable acrimony cause violent velli-

cations,

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IMAGINING the deleterious draught had not had sufficient time to bring on any violent inflammation or excoriation, or to make its way into the blood, vomiting and purging with plenty of diluents and sheathing substances, seemed the likeliest means to save the patient, if any thing could be hoped to succeed in so perilous a situation; I therefore ordered a mild, but operative emetic of pulv. rad. ipecactanha, and a mixture with sperm. ceti and oil, to be taken occasionally, still following up the patient with oil and water: I had reason to expect the emetic would also purge as well as vomit, and not only clear the stomach of the remains of the poisonous draught, but likewise carry downwards what portion of it might have passed through the pylorus by the contraction and agitation of the ventricle on the preceding vomiting. The apothecary demurred at the emetic, and objected the danger of its aggravating the effects of the poison by its stimulus and irritation; though I was not in the least convinced by the objection, yet, from an apprehension of the reflection which might probably be made after the tragical scene which seemed to be inevitable, I was staggered in my proceeding, and wished the objection had not been started. My brother, observing my uneasiness, asked me if he should send for Dr. Dymock; I gladly accepted this offer, as it rid me of my perplexity, and would give satisfaction to all concerned to have had the best advice: in the mean time I plied the patient with oil and water alternately, with which she vomited, but still grievously complained of a burning heat in the stomach and bowels. Her breath, and all she vomited, smelt very strong of the camphor; her pulse was moderate, and not much quickened. I had now given her about a gallon more of water, and half a

cations, inflammations, and gangrene: but the oil contributes greatly to prevent these fatal effects by sheathing the corrosive acrimony of the poison, preventing its adhesion to the delicate lining membranes of these first passages, and defending them from the violence of its attacks, while at the same time it promotes the discharge of their contents.—These qualities of oil also render it very serviceable in the other species of poison.

flask

flask more of oil, when Dr. Dymock arrived: upon informing him of all the particulars of the case, he, without hesitation, ordered an emetic of vin. ipecacuan. ʒj. which was immediately given; but the patient complained more and more of an inward burning heat, which made it necessary to supply her with more water before the emetic operated. It had, however, in a short time the desired effect, and operated plentifully, both by vomit and stool, especially the latter way; the stools, which continued to be discharged for near an hour without any griping pain, very manifestly discovered both camphor and oil being mixed with them. The purging now began gradually to abate, and soon after the burning heat in the region of the stomach became more tolerable, and insensibly grew better, the camphor being no longer perceptible in the breath or evacuations.

HER drink now was water, with the addition of a little milk.

THE patient's spirits which, by means of the great irritation and feverish tumult the caustic tincture had excited, kept up surprizingly, now began to fail her, and she was with difficulty got into bed; where, after complaining for a short time only of a soreness in the first passages, she lay sweating profusely for four hours in a very low, desponding condition.

A GENTLE opiate was exhibited, which took effect, and after a sound sleep of five hours the patient waked very easy, took some of the sperma ceti mixture, and had another sleep of three hours. She now found herself free from all her complaints; the previous slow fever, as well as the effects of the poisonous tincture, being intirely carried off.

It is remarkable that the patient found herself, for four days successively, in so happy a state of ease and tranquillity, as she had never before experienced, and to this day enjoys a perfect state of health.

THUS I have laid before you the true history of this case; for the simple relation of which I flatter myself I need make no apology, when I reflect the practice of physic must derive much greater advantages from plain histories of matter of fact, and just deductions drawn from them, than from the most ingenious hypotheses and speculative theories: these were of baneful influence to the progress of true knowledge, till your illustrious society taught the world the true method of investigating the laws of nature by observations of facts, experiment, and rational deduction.

THE following observations, which this case naturally suggests, seem to deserve our attention.

I. THAT in any similar accidents of swallowing corrosive, poisonous substances, a quick and resolute administration of these simple bodies, water and oil, in a large quantity, seems to be the most effectual method of preventing any bad consequences, and far preferable to the numerous boasted antidotes which have been handed down to us.

II. THAT an emetic may be more safely and effectually administered, and its operation waited for, after the acrimony of the poison hath been sheathed and blunted, and the coats of the stomach defended from its attacks by a liberal use of water and oil, than immediately after it is swallowed.

III. THAT as the slow fever and redundancy of milk, as well as the poison, were carried off by the copious discharge excited in the easy manner above-mentioned, might we not often hope for success in fevers occasioned by similar causes, plenitude and obstruction, from plentiful evacuations brought on after the same manner, by simple, diluent, and sheathing medicines?

IV. THE camphor was undoubtedly of great service in curbing the destructive effects of the Euphorbium, by blunting

ing its acrimony and soothing the nerves into an insensibility of irritation, and consequently an incapacity of spasmodic affections. I have tried the tinct. euphorb. cum camphor. on a horse's leg several times, and find it not near so caustic as without the camphor; and it is well known how much camphor involves the spiculæ, corrects the acrimony, and mitigates the effects of cantharides, saccharum Saturni, and rough mercurial and antimonial preparations.

V. To water and oil, therefore, we may justly add camphor, as a powerful corrector and expeller of poison in general: this it probably effectuates, first, by blunting the acrimony; 2dly, by calming the nervous system and securing it from spasmodic tumult and convulsion, which may be a consequence of its sheathing quality; 3dly, by its extreme subtilty and volatility, whereby it freely penetrates the smallest recesses of the body, and powerfully promotes a diaphoresis. Some late instances of the effects of camphor in poisonous cases greatly confirm this account.

THESE three simple bodies then, water, oil, and camphor, challenge the first place among the antidotes hitherto discovered, both of internal or external use, and are much more to be depended upon than any of the elaborate compositions calculated for this purpose by the ancients, as the theria Androm. Mithridat. conf. Paulin, &c.

[Phil. Transf.]

N° LXVI.

Observations on a newly-discovered Membrane which closes the Pupil of the Eye in a Foetus. By Dr. Albert Haller, President of the Royal Academy of Sciences at Gottingen.

[Translated from the Latin Original.]

ABOUT six years ago I dissected two foetuses brought to our theatre; they were delivered in the seventh month, after a difficult labour, and seemed to have both lost their sight in the womb.

IN order to inject them, I made use of oil of turpentine tinged with vermillion, and afterwards of a thicker matter, composed of wax: the first liquor is sufficiently penetrated, but does not pass so easy as isinglass into the cellular membrane.

THROUGH the cornea I discerned some small ramifications arising from the vessels of the iris which I had filled; they were extended across the aperture of the Pupil, and, as far as I could judge, floated at freedom in the aqueous liquor.

WE know that nature never bestows vessels without a Membrane to sustain them; whence I was led to imagine that there was one in the foetus destined for a covering to the Pupil, and which, though vascular, was in time to be abolished.

I WAS confirmed in this conjecture by an example in that sense which, next to the sight, is the most subtle; I mean the hearing, which in the foetus is beholden to nature for more organs to defend it than in the adult.

INDEED

INDEED in the former there is not only a white pulvous skin *, easily to be separated from the orbicular groove, commonly called the drum of the ear, which subsists in adults; but in the meatus auditorius of the fœtus there is besides a vascular Membrane, which covers that other dry internal one, and is easily separated from it, being softer, more pulpy and thick than it; as the infant advances towards the adult state, it is fed less and less with blood, and gradually grows dry, and decays.

THE existence of this new Membrane is demonstrated by the observation of M. Wachendrof, which I happened not to be apprized of till a long time after my own first observation; it is to be found in the *Commercium Norimbergense*, Ann. 1740, Hebd. 18.

THAT gentleman describes a black Membrane whose anterior lamina is a continuation of the iris, the posterior being probably no other than an inspissation of a dark-coloured juice, which becomes visible when its vessels are injected: M. Wachendrof calls it the pupillary Membrane, and gives a drawing of its vessels as they appeared in a microscope †. I was then convinced that the honour of this discovery was none of mine; but it gave me satisfaction enough that I confirmed the truth of it,

As since the time afore-mentioned two other twins were brought to our theatre, and after that a third fœtus, all of about seven months, I have further pursued the new discovery.

I HAVE verified all the observations: through the cornea may be seen both the ordinary vessels of the iris and the small arteries of this Membrane which closes the Pupil, whose vessels are those of the iris continued.

* See Comm. on Boerhaave, tom. iv. p. 330. concerning the discoveries of this epidermis.

† In March 1747.

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I SEPARATED the cornea, taking it at its origin forwarder than the place where it is detached from the sclerotic; then I could perceive this Membrane to be inflated and tumid, like a bladder, from the effort of the aqueous humour, which, by abundantly filling the posterior chamber, pushed the pupillary Membrane forward, which hindered it from running out.

I OPENED this Membrane to let out the aqueous humour, which altered and disguised its nature and colour; it then appeared of a slightly ash-coloured white, and was strong enough to bear being stretched by my knife over the Pupil, and so removed; I likewise took care to have a drawing made of it by a very curious hand *.

IT is all over bespread with minute vascular ramifications, resembling the branches of vegetables.

IN other eyes I have injected this Membrane in the like manner, and it appeared blackish and mucilaginous, as M. Wachendorf has described it, rending asunder with the slightest pressure, yet so that its fragments kept adhering to the iris, and might be easily seen within the eye.

AFTER these reiterated experiments, I cannot see why this pupillary web should not be ranked among the constant organical and vascular Membranes of the foetus; but in the adult it wastes away; for there are not, as doubtless there ought not to be, the least remains of it to obstruct the entry of the rays of light into the cornea.

FURTHER experiments on infants may in time inform us at what age this Membrane disappears; I suspect that it may remain some time: the foetus cannot see, as it would be altogether needless; neither are the eyes of infants at once properly disposed to receive the luminous rays, but by degrees;

* Mr. C. J. Rollin, heretofore my demonstrator,

it is therefore probable that this Membrane bursts asunder at first, and, through its suppleness, is dissolved in the aqueous humour, where its vessels finally give way, and so it comes to disappear intirely.

NEW-BORN infants can see nothing; and if I am not mistaken, it is some weeks before the approach of a candle, or the offer of some injury, can make them wink; the reason of this phænomenon has been inquired into: M. Petit ascribes it to the thickness and wrinkles of the cornea *. But in men, and more particularly in dogs, the cornea is transparent; and in our foetuses we could easily discern the vessels of the iris through it; whence it should appear that such a cause can produce no great obstacle to the rays, and therefore we are to see for some other. •

THE eyes of new-whelped puppies are perfectly transparent †; but their eye-lids are shut and glued together; and this is the cause of their blindness; for certain it is, that they are destitute of any pupillary Membrane: but in the man, and even in the foetus, the eye-lids simply approach each other without any thing that can in reason obstruct vision, unless it be the redish tinge of the aqueous liquor and our pupillary Membrane; because in the first the cornea, though thick, does not intercept the rays ‡, the red tinge of the cornea is common to all the other liquors of the foetus which exhale: those of the amnios, the peritonæum, the pericardium, and the tunica vaginalis, and also that which is distributed throughout the whole cellular membrane, and often produces anasarca in the heads of foetuses, are all of them constantly redish; so that their canals of exhalation must needs be, during this period, pretty wide, which afterwards close as the vessels become harder and more contracted.

* Memoires de l'Acad. des Sciences, p. 727.

† M. Petit represents the cornea as cloudy, and the crystalline as opaque; but I have found both to be perfectly transparent.

‡ M. Petit himself acknowledges that he has seen very transparent corneas.

N^o LXVII.

An Account of the Case of a young Man who had lost the Use of his Hands by cleaning Brass Wire. By Mr. Samuel More, Apothecary in Jermyn-street.

THE disorders to which mechanics are unavoidably subjected by their employments, have exercised the pens of several ingenious writers; among whom I would not presume to appear, but that I hope the publishing the following case may be of some service; for I am certain every one who has been in the least conversant with the labouring people of this town, must frequently have observed their hands in a condition something resembling, though perhaps not quite so bad as that of the young man whose disorder is the subject of the following paper.

AND as there is great reason to believe that the complaint herein treated of frequently happens to persons employed in the dying business, they will hereafter have a method of cure laid before them, which, with little expence, will probably be of great service to them; and on that consideration only I have been induced to submit this account of the disease to the inspection of the Public.

The Case of Francis Newman, Nephew and Apprentice of Mr. Newman, Dyer in the Maize, Southwark, who had lost the Use of his Hands by cleaning Brass Wire.

FOR the more readily explaining the following case it is proper to premise, that on drawing Brass Wire for the pin-makers, the frequent passing it through the fire to anneal it, covers it with a crust, which it is necessary to take off before they can make use of it; and for this purpose it is sent to the dyers, who letting it lie for some time in the liquor with

with which they have dyed what they call Saxon colours (which liquor is composed of water, oil of vitriol, alum, tartar, &c.) and then throwing it forcibly three or four times against the ground, the crust is by degrees broken off, and the Wire rendered bright and fit for use. The gratuity given for this is generally allowed to the apprentices; and in this work Francis Newman had frequently (at his leisure hours) employed himself, till about the month of August 1759, when the cuticle on the palms of his hands and the inside of his fingers was become so hard and rigid, that he was no longer capable of doing either this or any other business.

For relief of this disorder he applied to the person who attends the family in capacity of apothecary, who gave him several doses of purging physic, but without success: he was next admitted an out-patient at St. Thomas's hospital, where he attended six weeks or two months, but without receiving any benefit.

SOMEBODY then told him his complaint was owing to the scurvy (to which he had been subject) and he accordingly applied himself to several persons who advertise remedies for curing that distemper, and among the rest to Mr. Ward, of whom he had some pills, and once by mistake took two of them for a dose, which operated so violently, that every body in the family imagined he could not survive it; however, he still continued in the same condition: and now thinking that if he was admitted an in-patient in the hospital he should be more likely to obtain a cure, he got himself admitted, and was there about two months longer; at the end of which time he was discharged, but in no better condition than before.

ABOUT a fortnight after this, and a twelvemonth from the beginning of his disorder, viz. August 10, 1760, the person who is foreman to Mr. Newman desired leave to write to me for my opinion of the case, which being very readily granted, he desired me, by letter, to come and see a young

man who, as he expressed it, “ had poisoned his hand with
“ brass and oil of vitriol.”

WHEN I first visited him, I found him with his hands quite stiff, and utterly incapable of any business whatever; and having already had so much advice, and taken so many medicines, he concluded his disorder was incurable, and that he should intirely lose the use of his hands, the skin on the palms of them (the right hand rather the worst of the two) having the exact appearance of parchment, full of chaps; and when I endeavoured by force to straighten the fingers, the blood started from every joint of them.

AFTER hearing the best account I could get of the cause of this complaint, I imagined that, as the disease had been contracted by his frequently dipping his hands into a violently acid liquor, the most probable method of relieving him would be, by the application of an emollient liniment mixed with an alkaline lixivium; for this purpose I ordered as follows:

R Ol. olivar. ℥ iv.
Lixiv. falis alkal. fix. ℥ ij.
M. f. linimentum.

With this he was ordered to anoint his hands frequently, especially going to bed; and to prevent the liniment being too soon rubbed off, constantly to wear a pair of gloves.

ABOUT four days after I found the skin a little softened, and I could extend the fingers with less pain than before, and no blood issued upon my endeavouring to move them: this would have encouraged me to have continued the use of the same liniment; but as he complained much of its making his hands smart every time he used it (and indeed this was the first application among the many he had tried, that ever gave him any uneasiness) I concluded that the addition of some yolks of eggs might lessen the acrimony of the alkaline salt without at all abating the efficacy of the liniment; I therefore composed the liniment thus:

R^x Ol. olivar. ℥ iv.
 Lixiv. falis fix. ℥ ij.
 Vitel. ovor. n^o ij.
 F. linimentum.

To be used as before. This mixture not giving him so much pain as the former, he had used it all in three days, and then coming to me for more, I found his hands still continue to mend; the skin that had grown hard scaling off, and a new flexible one appearing underneath; the chaps were many of them healed, and he began to have some use of his fingers. Encouraged by this success, he continued the use of the last prescribed liniment; and as from his not having had the proper use of his fingers for so long a time, the joints of them had in a great degree lost their motion, I advised him alternately to clench his fist, and to stretch out his fingers many times a day.

THE disorder had been so long upon him, and (if I may be allowed the expression) had taken so deep root, that although he began very sensibly to amend from the first application of the liniment, yet it was full two months before I thought it adviseable to leave off the use of it; and then, to prevent a relapse, I gave him the following ointment:

R^x Axung. porcin. ℥ ij.
 Vitel. ovi,
 Ol. lavend. gutt. v.
 F. unguentum.

With orders to anoint his hands with it every night going to bed. This ointment he has continued to use about a month, and is now perfectly restored to the use of his hands, and begins again to work at his business.

DURING this course of anointing he took no internal medicines, except three doses of purging physic.

N° LXVIII.

A curious and particular Account of the Quinquina, or Jesuit's Bark, its Cultivation, Growth, &c. By the Chevalier de la Condamine.

[From the Memoirs of the Royal Academy of Sciences at Paris.]

I SET out from Quito for Lima, and of the two roads thither, the one by Guayaquil, the other by Cuenca, I chose the latter, though the longest and worst, that I might take Loxa in my way, and view the Quinquina-tree, of which we have to this day had but an imperfect knowledge in Europe. Loxa or Loja, which is pronounced with a guttural aspiration familiar to the Spanish language, is a small town built by Mercadillo, one of the Gonçales Pizarro's captains, 1546 *, in an agreeable valley on the river Catamayo: the two meridian altitudes of the sun which I took there, give us latitude four degrees and almost one minute south; that is, near seventy leagues south of Quito, being, according to my judgment, under the same meridian nearly and about eighty leagues from the coast of Peru. I take its elevation to be about a mean between that of the mountains which form the vast chain of the Andes and the valleys of the coast. The quicksilver, which I have observed near twenty-eight inches high at the level of the sea at Panama, in eight degrees of north latitude, at Manta in one degree north, and at Callao, the port of Lima, in twelve degrees south, and on the highest accessible mountains about Quito at fifteen inches, stood at Loxa at twelve inches eight lines; whence may be concluded, on comparing several experiments which we have made, its known height, that Loxa is about eight hundred toises above the level of the sea; the climate is very pleasant, and the heats are indeed great, but not excessive.

* Garcillasos Comm. de los Incas, tom. ii.

THE best Quinquina, at least that of most repute, is found on the mountain of Cajanuma, about two leagues and a half to the South of Loxa, and from thence came the first of it that was brought to Europe. Within these fifteen years the dealers have been wont to obtain a certificate from a notary that their Quinquina is of the growth of Cajanuma. I arrived at this mountain the third of last February, and staid all night on the top of it at a peasant's, whose occupation was gathering the Bark from the Quinquina-tree, and had therefore built him a hut amongst them on the road, and on the spot I saw and examined at leisure several of these trees, and from the life made a sketch of a branch, with its leaves, fruits, flowers, and seeds, which may be seen all together at any season of the year: the next day I took several branches in flower along with me to Loxa, which served me for finishing my drawing and colouring it according to nature.

THEY commonly reckon three species of the Quinquina, though some make four; the white, the yellow, and the red; I was told at Loxa that these three kinds differ in their virtue only, the white having scarce any virtue, and the red excelling the yellow; but my host of Cajanuma, who spends his whole life in barking these trees upon this mountain, assured me, which has also been confirmed by the testimony of others well acquainted in this matter, that the yellow and the red have no notable difference in their flower, fruit, or outward Bark; nay, that the eye cannot distinguish one from the other by the outward appearance, and that it is only the knife that discovers the yellow by its paler and softer Bark upon incision; otherwise the red and the yellow grow together promiscuously, and their Barks are gathered indifferently; and though prejudice goes in favour of the red, yet in drying the difference becomes less discernible, and both are equally brown outwardly; and this passes for the surest mark of good Quinquina, and is what the Spanish merchants mean by *enoez preeta*: another distinguishing mark of it is, its being rough
and

and brittle. As for the *Quinquina*, the same man assured me that its leaf was rounder and not so smooth as that of the two other sorts, being a little uneven; also its flowers are whiter, its seeds larger, and the outward surface of its Bark whitish: it commonly grows on the highest part of the mountain, and never amongst the yellow and the red, which usually grow half way up among the cliffs and hollows, and especially in the most shady places. It remains to know whether this observable variety does not proceed merely from the difference of soil, and from the greater cold it is exposed to; this would agree well enough with what I have been assured of, that the *Quinquina* which grows in the hottest places has the most virtue.

My short stay at Loxa would not permit me to examine myself these distinctions of colour, virtue, and diversity of species.

THE *Quinquina*-tree never grows on plains; it rises up straight, and may be seen at a great distance above the tops of other trees that are about it; for it is never found in groves, but single, and scattered up and down among other trees of divers sorts; if they are permitted to stand, they grow very large, sometimes bigger than a man's body; the middle size are eight or nine inches diameter; but it is now rare to find them of this size upon the mountain which produced the first *Quinquina*. The trees from whence the first Bark was taken, which were very large, are all dead, having been intirely stripped, which infallibly kills them when they come to be old; experience has shewn that stripping kills some of the young ones also, but the greatest part escape: for this operation they make use of a common knife, which they hold in both hands; the barker sticks it into the Bark as high as he can reach, and so draws it downwards as low as he can. It does not appear that the trees which grow where the old ones stood have less virtue than them, the situation and soil being the same; the difference, if there be any, may
arise,

arise, perhaps, from the different ages of the tree. Few but young ones are now to be met with; I do not remember to have seen any much thicker than my arm, or about twelve or fifteen feet high: those which are cut young shoot forth new branches from the stumps.

I was informed at Loxa, that heretofore they preferred the coarsest Bark, and laid it by as a rarity; but now the finest is most esteemed; the merchants may possibly find their account in it, as it takes up less room in packing. But a director * of the English South Sea company at Panama, through which all the Quinquina that comes to Europe must pass, assured me that the preference given at present to the fine Bark, is in consequence of several chymical analyses and experiments which have been made on both sorts in England. It seems probable that the difficulty of thoroughly drying the large, coarse Bark, and the humidity it is naturally apt to contract and retain, has helped to bring it into disrepute. Vulgar prejudices will have it, that to lose nothing of its virtue the tree should be barked in the moon's decrease and on the east side: these circumstances, as also its being gathered on the mountain of Cajanuma, were certified by a notary in 1735, when the Marquis de Castelfuerte procured a quantity of Quinquina from Loxa to carry to Spain on his return.

BUT, for the sake of not lying idle three quarters of the year, this prejudice was pretty well got over; and my landlord at Cajanuma assured me that all seasons of the year are equally proper, provided the weather be dry; that the Bark, after taking it away, should be exposed to the sun several days together, and for its better preservation should not be packed till it has lost all its humidity, and that this is an essential circumstance, which indeed seems very probable: it is not uncommon, for want of this precaution before the packing, to find it mouldy, and then the merchants are apt to lay the

* Mr. Thomas Blechynden.

fault upon the moon, rather than upon the negligence of those who did not dry it as they should have done. I shall not go into a more particular description of the Bark itself, it being sufficiently known in Europe :

THE leaves are affixed to a stem about half an inch long ; they are smooth and of a fine green, which is deep on the upper side and bright beneath ; their outline is even and of the shape of a lance, being rounded at bottom and terminating in a point : they are for the most part an inch and a half or two inches broad, and two and a half or three inches long.

N° LXIX.

A Method to extract Sugar from common Plants.

By M. Marggraf, &c.

[An original Translation.]

THE Plants (says this ingenious inquirer, after a short introduction) which I chemically examined, in order to extract Sugar from their roots, and which yielded a considerable quantity, are very common in most countries, and require neither a fine soil nor assiduous culture ; such for instance are,

1. WHITE beets (*cicla officinarum*).
2. SKIRRETS (*sifarum Dodonæi*).
3. RED beets.

THE roots of these three plants yielded a large quantity of pure Sugar. You may know the roots of the plants which contain Sugar by these characteristics : when you have cut the roots in pieces, and wiped them very clean, they have a

very agreeable taste; and if you examine the pieces by a microscope, you will perceive whitish crystalline particles, which are a true Sugar.

As Sugar is a salt which dissolves even in brandy, I imagined that the Sugar might be separated from the parts of plants by means of the best and strongest brandy I could get. Previously to determine the quantity of Sugar dissolvable this way, I put into a glass an ounce of the finest and best Sugar well pulverized, together with four ounces of the strongest brandy; the whole being well digested, I boiled them together, and the Sugar was soon perfectly dissolved. Whilst this solution was yet warm, I strained it through a linen cloth into another glass; I corked it close, and after it had stood eight days, I had the pleasure of seeing the Sugar form itself anew into very fine crystals: to succeed in this experiment, the Sugar and glass must be quite dry, and the brandy well rectified.

HAVING prepared the way by this experiment, I took the roots of white beets, and having cut them into small slices, I laid them by the fire to dry, taking care not to burn them; I then reduced them to a coarse powder, and laid it to dry a second time, because it is very apt to contract moisture: whilst this coarse powder was yet warm, I put eight ounces of it into a glass vessel, and poured upon it sixteen ounces of brandy, so strong that it fired cannon powder. The vessel was above half full, and having corked it close, I set it in a sand heat till the brandy began to boil; stirring it from time to time that the powder might not settle to the bottom.

As soon as the brandy began to boil, I took the vessel off the fire, and poured the mixture as quickly as possible into a linen bag, and pressed it well to squeeze out all the liquor; I then passed this liquor through a linen cloth whilst it was yet warm, and put it into a glass vessel well corked, and set it in a warm place. The liquor was at first turbid, but after

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some weeks a crytalline sediment appeared, which had all the characters of an impure Sugar, and was full of very hard crystals. To purify them yet more, I dissolved them a second time in brandy, and proceeded in the same manner as I had done with the real Sugar.

By this method, which was the first that I fell upon, I obtained from the three roots above-mentioned the following quantities of Sugar :

1. FROM half a pound of the root of white beets half an ounce of pure Sugar.
2. FROM half a pound of skirrets an ounce and a half of pure Sugar.
3. FROM half a pound of red beets one ounce of pure Sugar.

It is evident from these experiments that lime-water is not at all necessary to dry and thicken the Sugar, as some pretend, since the Sugar crytallizes without it.

BEING thus assured that there was a real Sugar in plants, I endeavoured to find out a less expensive manner of extracting it; and the best way seemed to me, first to press out the juice of the plants, then to purify this juice, and to prepare it for crytallizing by evaporation; and lastly, to purify the crystals that proceeded from it.

I TOOK a certain quantity of skirrets, I cut the roots whilst fresh into small pieces, and pounded them as small as possible in an iron mortar; I then put them into a linen bag, and pressed out the juice in a press prepared for the purpose: after this I poured water upon the roots remaining in the bag, and pressed them a second time. I then put the liquor all together into a very clean vessel, and let it stand to settle in a cool place for forty-eight hours; in which time it became clear, and a mealy substance

substance settled to the bottom ; I then poured off the liquor gently, and passed it through a linen cloth into another vessel.

THE first clarification being thus made, I put some whites of eggs to the juice, and boiled it in a brass pan, scumming it continually till no further impurities appeared on the surface ; I then passed it through a linen cloth, and the liquor was as transparent as the clearest wine. I boiled it again in a less pan till it was considerably decreased, and so again and again in yet less vessels, till there remained only a pretty thick syrup, which I put into a very clean glass vessel, and set it in a warm place. I let it stand above six months, and then found the Sugar sticking to the sides of the glass in the form of little crystals : to purify these crystals I put the vessel into warm water, and when the heat had penetrated the glass so as to render the mixture fluid, I poured both the liquor and crystals into an earthen vessel, broad at top and narrow at bottom, and the bottom perforated with several holes ; this vessel I put into another, and covered both up, and set them in a temperate place : by these means the syrup gradually dropt into the lower vessel, and the crystals were left in the upper one. This crude Sugar I then put into blotting paper folded different ways, and pressed it lightly in a press ; this dried it, and rendered it more pure, the paper imbibing a good deal of the tenacious, viscid syrup which yet stuck to the Sugar.

THE Sugar thus cleaned of the greatest part of its impurities, I dissolved again in water, passed it through a clean linen cloth, and boiled it to the consistence of a thick syrup, then put a little lime-water to it, and boiled it gently till it became ropy ; I then took it off the fire, and stirred it about till it cooled and thickened a little ; after which I poured it into a well-burnt earthen vessel in the form of a cone, closed at the small end with a wooden stopper, which vessel I put into others that were deeper, and set them in a temperate place. In a few days the Sugar became tolerably hard and full

of crystals; and when it had stood eight days, I took out the stopper, and set the vessels in a warm place, that the syrup might run off: this syrup is fit for the same uses as common treacle; and the Sugar, after drying and purifying by means of the blotting paper as before, is equal to the best brown Sugar of St. Thomas, commonly called Moscovad. By a similar process Sugar may be extracted from red and white beets. The Sugar of skirrets is of a better quality than that of red beets, but the Sugar of white beets is best of all.

I ENDEAVOURED to extract Sugar from the stems and leaves of these plants, but could obtain from them only a sort of tartar: it is very remarkable that the roots of these plants should contain Sugar, and that the stems and leaves should be intirely destitute of it.

THESE experiments may be useful to farmers and other people of this country in low circumstances*; instead of buying Sugar, which is very dear, they may obtain it from the plants at their own doors: they need not go through all the steps of the foregoing process; for them it may suffice to express the juice, to strain and purify it a little, and then to boil it down to the consistence of a syrup, and so use it; it will certainly be more pure than the gross treacle of the shops. Besides, from these experiments we learn that those countries which produce the Sugar-cane are not the only countries which nature hath furnished with Sugar.

I MADE trials upon several other vegetables besides those I have mentioned; I could obtain no Sugar from carrots; the juice they yielded was extremely sweet, but resembled honey rather than Sugar; parsnips yielded a little Sugar; pumpions not a grain: two species of dogs grass yielded a very sweet juice, but not Sugar. I obtained Sugar from the juice of the flowers of the largest species of the American aloes. The juice

* Germany.

which

which distils from birch-trees in winter (see p. 268, 269.) upon an incision being made in them, yields a sort of manna. Lastly, raisins being moistened with water, and then pounded and pressed, yield a syrup which contains a sort of Sugar.

Nº LXX.

On WINE. From Caspar Newman, by W. Lewis, M. B.

THE juices of sweet fruits in general, currants, mulberries, raspberries, apples, pears, &c. are called, when fermented, Wines; but the name is more peculiarly applied to the fermented juice of the grape, or the fruit of the vine-tree.

THERE is a great variety of grapes, colourless, yellowish, bluish, and red, more or less sweet, and of more or less flavour: the colour is lodged not in the juice, but in the skin of the grape; the juice however, as a menstruum, frequently extracts and becomes impregnated with it during its expression from the fruit. One and the same kind of grape proves greatly different in taste and flavour, according to the climate and exposure to the sun. In cold countries the vine, if it grows at all, never ripens its fruit; and even in France and Italy, I have observed that the grapes produced on the south sides of the hills are notably sweeter than those which grow on plain grounds. Among the Tokay Wine hills there is but one which directly fronts the south, and the advantages of its situation are not a little remarkable: from the extraordinary sweetness of its grapes it is called the Sugar-hill; it affords the most delicious of all the Hungarian Wines, and is appropriated to the use of the Imperial family.

IN very warm, dry seasons the grapes at the bottom of the hills are best; in warm and moist ones those at the top; such

as

as grow in the middle region being always good. In dry summers the grapes are sweetest, but least juicy; in rainy ones they abound with juice, which proves proportionably weaker and more dilute. Frost in autumn promotes their ripening; but frost succeeding heavy rains makes them apt to burst and shed their juice. In some places the grape is concentrated, or rendered richer, by suffering it to remain on the tree till great part of its watery moisture has exhaled, the stem of each cluster being cut through when the fruit is ripe, to prevent the afflux of any fresh juice from the plant. The sweet Hungarian and Spanish Wines are made from grapes that have been thus half dried. The raisins and currants of the shops are different species of grapes, dried either in this manner, or by the solar or culinary heat after gathering.

THE juice of the grape is called, before its fermentation, Must: different sorts of must are obtained from the same kind of grape produced in the same vineyard, according to the method of management; the best is that which issues upon breaking, bruising, or treading the picked fruit; inferior sorts are extracted by forcibly pressing the intire cluster, stalks and all. Dilute, watery musts are enriched by infusing in them dried grapes, or by inspissating a part of the liquor, and adding this to the rest. By these means strong, full-bodied Wines are obtainable from the poorest juices; and by similar management even the better sorts of Grape Wines are imitable with the juices of other fruits artificially concentrated, or heightened with the simple sweetness of sugar.

WINE may be divided, with respect to the fermentation, into three classes:

I. THOSE of the first do not indeed deserve the name of Wines, as having scarcely suffered any degree of fermentation at all, and being no other than boiled must; several of the Italian Wines are of this sort, and are called by the general name of *Vino colto*, or boiled Wine: it is too thin, watery
juice,

juice, extremely prone to ferment, and in which fermentation, when once begun, can scarce be suppressed till it has run beyond the vinous state, that this process is applied. By boiling the fermentative quality is restrained, and the liquor becomes richer, and continues fit for drinking for at least a year or two, tho' it is never so wholesome as the fermented Wines. The effects of Must and Wine upon animal bodies are diametrically different; must relaxes and liquefies, and, if drank immoderately, is apt to produce dangerous fluxes; perfect Wine, on the contrary, corroborates and constringes.

II. THE second class comprehends those Wines which have undergone fermentation, but not a complete one; of these there are two kinds; the first is, the thin sweet Wines, which are no other than Must partially fermented, or whose fermentation is checked while it can be checked, before the sweetness is gone off; these Wines can scarcely be kept above a year; such are the Tyrol, some of the Savoy, and several of the Italian. The second sort is the strong, full-bodied, rich, sweet Wines, which are generally a mixture of fermented and inspissated must, the latter being added to increase the richness of the liquor, and prevent the fermentation from running beyond its due limits: these kinds of Wines greatly heat the constitution, and ought to be very sparingly drank; such are Malmsey, Canary, and some of the Spanish and Hungarian Wines.

III. To the third class belong those Wines which have been completely fermented, and have thrown off their gross matter; these are the most perfect Wines, and for common use the most wholesome.

THE principal Wines drank in Europe are as follows:

I. THE Madeira islands, and Palma, one of the Canaries, afford two kinds; the first called Madeira Sec, the latter, which is the richest and best of the two, Canary or Palma Sec;

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Sec; the name Sec (corruptly written Sack) signifies dry, these Wines being made from half dried grapes. There is another sort of Sec Wine, inferior to both the foregoing, prepared about Xeres in Spain, and hence called, according to our orthography, Sherris or Sherry.

2. THE Wines of Candia and Greece, particularly the latter, are of common use in Italy; Malmsey was formerly the produce of those parts only, but is now brought chiefly from Spain: it is a sweet Wine, of a golden or brownish yellow colour. The Italians call it, *Manna alla bocca e balsamo al cervello*, "Manna to the mouth and balsam to the brain." Zant and Cephalonia send also to Venice some good, and no small quantity of indifferent Wines. Almost all the Wines, indeed, made use of in the Venetian territories, come from Greece and the Morea; of which there are some sorts so bad, and so cheap, that large quantities are made into vinegar for the preparation of ceruse.

3. ITALY, not Greece, produces the *Vino Greco*; this is a gold-coloured, unctuous Wine, of a pungent sweetness, the growth of Mount Vesuvius, greatly sophisticated by the Neapolitans: in the neighbourhood of Vesuvius is made the *Mangiaguerra* Wine, as also a thick, blackish one, called *Verracia*; and at the foot of the hill the delicious *Vino Vergine*. The Italians apply this last name likewise to all the other Wines made without pressure. The kingdom of Naples affords the *Campania* or *Pausilippo* and *Muscatel*, the *Surentine*, *Salernitan*, and other excellent Wines, as also the *Chiarello*, much drank at Rome: but the principal of all their Wines is the red, fat, sweet, and gratefully poignant one, called *Lachryma Christi*.

4. The ecclesiastical state produces the light, pleasant *Albano* and the sweet *Montefiascone*, a yellowish, not a very strong Wine, which comes the nearest to good Florence, but does not keep well; together with several of less note, as the
Nomenton,

Nomenton, Monteran, Velitrin, Prænetic, il Romanesca, d'Orvieto, &c.

5. IN Tuscany are the excellent white and red Florence, the celebrated, hot, strong red Wine de Monte Pulciano, the Montalneo, Porte Hercole, &c. But along the coast of the Adriatic, at Ancona, Rimini, Pesaro, as far as Bologna, I meet with exceeding bad Wines, chiefly of the boiled, unfermented kind, heavy, disagreeable, and unwholesome.

6. IN Lombardy also there is abundance of bad Wines; the Modenese and Montferrat are tolerable; the Marcemino, produced about Vicenza and Padua, pretty good: the other Wines most commonly drank in that province are the Brescian, Veronese, Placentine, Lumelline, and Pucine; and in the Genoese, the Vinodi Monte Vernaccia, Vino amabile or Vino di cinque Terre, and Vino rarresse. Between Nizza and Savona is produced an incomparable Muscadine; near Aquileia is the Rosaty; and near Pavia the Vino Piccante.

7. PIEDMONT, and part of Savoy, have excellent light Wines.

8. THE Sicilian, Sardinian, and Corsican Wines are also good; the first is particularly: the Catanean, Panormitan, Messinian, and Syracusan, are accounted the best, and are chiefly bought up by the knights of Malta.

9. Most of the Spanish Wines are composed of fermented or half fermented Wine mixed with inspissated must, and variously manufactured, or of an infusion of dry grapes in weak must. No Wines freeze more difficultly than the Spanish, these abounding both with unctuous matter and with inflammable spirit: we have a few of these Wines in Germany, as the Alicante, which is a thick, strong, very sweet, and almost hauseous Wine, Sherry, Spanish Malmsey, and that simply called Spanish Wine; but in Spain itself there are many more,

Tarragon, Salamanca, Malaga, Cordoua, Galicia, Andalusia, fundry bastards, Vino de Toro, &c.

10. IN Portugal there is plenty of Red Port, a cheap, but not a very excellent Wine, drank in large quantities in England. The best Vino Tinto, a blackish red Wine, used by the coopers for colouring other Wines, is said by some to be the produce of Portugal: this kingdom deals largely also in Madeira, of which the king receives yearly twelve thousand pipes by way of tithes.

11. IN France there is great variety of Wines; of which the strong, sweet, full-bodied, spirituous ones are called Vins de Liqueur. There is scarcely a province that does not produce Wine: Languedoc and Provence afford the sweetest, and the same provinces, with Champagne and Burgundy, the strongest. The Wines of the northern parts, as Picardy and Bourdeaux, are the worst; and those about the middle of the kingdom, as Paris and Orleans, of a middling kind: the most celebrated of the French Wines are Champagne, Burgundy, Vin de Beaune or Partridge-eye, Côté Roti, St. Laurence, Frontinac, Muscat de Loin, Cahors, Hermitage, Grave, Vin d'Haye, &c.

12. In Switzerland the best are the Neufchatel, Velteline, Lacate, and Reiff Wine; the Velteline Straw Wine, so called from the grapes being laid for some time upon straw before they are pressed, is particularly celebrated.

13. THE dry grape Wines of the Upper Hungary are in general excellent, and greatly superior to those of the Lower; they have a delicious, aromatic smell and taste, a notably diaphoretic and corroborating virtue, and when drank freely occasion no head-ach, heaviness of the limbs, or other inconveniences: they do not easily become vinewed even in open vessels, and retain their sweetness and agreeableness for a length of time, though they lose a little from year to year.

14. AMONG

14. AMONG the German Wines the Tyrol are very delicate, particularly those of Tramin and Etsch, but they do not keep.

15. GOOD Austrian Wine is not to be rejected; those of Kloster, Neuburg, and Brofenberg are accounted the best, and seemed to me to excel in taste that of Edenburg in Lower Hungary: there are also good Wines in several other parts of the Imperial dominions.

16. IN the Palatinate the best Wine is that of Worms, especially the sort called Women's milk; and next to this those of Edinghof and Ambach.

17. AMONG the more esteemed German Wines are to be reckoned also Rhenish, Mayne, Moselle, Neckar, and Elsass: A certain writer calls the Rhenish made in Hochheim (Hock) the Prince of the Wines of Germany.

18. THE Bohemian, Silesian, Thuringian, Misnian, Naumburg, Brandenburg, and other German Wines, are greatly inferior to the foregoing; some, however, of those of Misnia and the Marché, made from ripe picked grapes, have this advantage, that they are greatly meliorated by age, so as to be preferred by many to the Rhenish Neckar and Franconia Wines, and frequently mixed with others of greater note. The tartish German Wines keep the longest of any; some of them have been kept for two or three hundred years; and in Strasbourg there is a cask of fourteen hundred years old, and many above seventy; the Wine being occasionally racked off into smaller and smaller casks that the vessel may be constantly full. These very old Wines are preserved rather for curiosity than use, as they not only grow too strong for drinking, but at last quite disagreeable: the best are those of a middle age, from twenty to about fifty years.

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WINE sensibly wastes in keeping, how closely soever the cask is stopped, a part transpiring through the pores of the wood; it is not the spirituous, but the watery part that is thus lost; for the remaining Wine proves stronger than at first, and the strength continues to increase as the quantity diminishes. In filling up the vessels, for it is necessary they should be kept full, we must be careful not to mix Wines of dissimilar qualities; the Hungarian does not well bear any other Wine, particularly Rhenish; if the spontaneous diminution of a cask of Hungarian Wine is made up with Rhenish, though both kept extremely well by themselves, the mixture presently spoils.

COOL cellars are of primary consequence for the preservation of Wines; it is owing wholly to want of sufficient defence from the warmth of the weather that Wines are so apt to fret or run into a new fermentation on the approach of summer. The situation of Berlin does not admit of deep cellars: I have been in some at Vienna three stories deep; the cellar of the jesuits college seemed to be not less than the height of a church-steeple under the street. It is necessary, for the preservation of some Wines, to fumigate the casks with burning brimstone; to which some add, perhaps uselessly, vinous spirits and aromatic ingredients: the fumes of brimstone strongly resist fermentation; but Wines that are largely impregnated with them cannot be recommended as wholesome: the colour of red Wines is destroyed by them. What is called Stum is no other than must whose fermentation has been prevented, or prematurely suppressed by fumigation with sulphur.

THE colours of Wines are frequently artificial; a pale yellow may be natural, but a fine deep yellow proceeds from an addition of burnt sugar, or other colouring matters, or from the oaken casks. Wines may be naturally of a pale, dilute red, but a deep red is almost always the effect of artificial additions,

ditions, as the red woods, bilberries, &c. In France no secret is made of these practices, the colouring matters, after they have been used, being publicly thrown out.

TURBID Wines are fined by a mixture of whites of eggs, powdered alabaster, and fish glue; some use the plant lycopodium. Acid ones are cured by an addition of salt of tartar or absorbent earths, in such quantity as to absorb and neutralize only the redundant acid, and not that which is essential to the Wine, for in this case the liquor would soon become vapid. Weak Wines are improved by an addition of spirit, particularly before the fermentation is completed, for after this period it is apt to spoil the vinosity. Poor Wines are enriched by sweets, and flavoured by various additions, so as to emulate the more costly; thus elder flowers give the flavour of Moselle: even the more delicious Wines have been imitated also without a drop of the juice of any kind of grape, with solution of sugar, juice of currants, figs, and other fruits.

SOME of the dealers in Wines have had recourse to artifices of a more dangerous kind, which have been pernicious to thousands; they have sweetened acid Wines by litharge, or other preparations of lead, and impregnated sweet ones with mercury sublimite and with arsenic: lead is discovered in Wines by adding a decoction of orpiment made in lime-water. If the Wine is genuine it does not sensibly change its colour on this addition, though on standing a yellowish-white powder falls to the bottom; if it has any saturnine impregnation, its colour becomes immediately darker, brown, redish, or blackish. Arsenic may be detected by a solution of lead in aqua-fortis; and mercury sublimite by volatile alkaline spirits, or by a solution of fixed alkaline salts.

THE goodness and wholesomeness of Wines are judged from their being bright, clear, and sparkling in the glass; of an agreeable, reviving smell and taste, leaving, when held in the

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the mouth for some time, a slight sense of astringency ; being moderately strong and spirituous ; passing freely by urine ; exciting appetite ; producing a gentle sweat in the night ; keeping the belly open next day, without being followed by any head-ach, heaviness of the limbs, or other uneasiness : such a Wine, moderately used, is a very valuable cordial. The sweet, rich Wines are either new, or very strong and fiery ; they heat the blood much more, and, if drank to any degree of excess, their effects continue much longer than those of the thinner Wines that contain an equal quantity of spirit. The red Wines in general have the greatest astringency.

THE principles of which Wines consist are,

1. WATER, the basis of all fluid.
2. INFLAMMABLE spirit.
3. A FINE saline matter, which arises in distillation immediately after the spirit called by Becher Media substantia Vini.
4. A GROSSER salt, called Tartar, which in part separates on standing, and adheres to the sides of the vessels in solid masses.
5. A GUMMY or mucilaginous substance : and,
6. A GROSS, unctuous, or resinous one.

THE following table exhibits the quantity of the several principles in a quart of each of the Wines I have examined.

Table

Table of the Contents of different WINES.

	Highly rectified spirit.			Thick, oily,unc- tuous, re- finous matter.			Gummy and tar- tareous matter.			Water.			
	oz.	dr.	gr.	oz.	dr.	gr.	oz.	dr.	gr.	lb.	oz.	dr.	gr.
Aland	1	6	0	3	2	0	1	5	0	2	5	3	0
Alicant	3	6	0	6	0	20	0	1	40	2	2	6	0
Burgundy	2	2	0	0	4	0	0	1	40	2	9	0	20
Carcassone	2	6	0	0	4	10	0	1	20	2	8	4	30
Champagne	2	5	20	0	0	40	0	1	0	2	8	3	0
French	3	0	0	0	6	40	0	1	0	2	8	0	20
Frontignac	3	0	0	3	4	0	0	5	20	2	4	6	30
Vin Grave	2	0	0	0	6	0	0	2	0	2	9	0	0
Hermitage	2	7	0	1	2	0	0	1	40	2	7	5	20
Madeira	2	3	0	3	2	0	2	0	0	2	4	3	0
Malmsey	4	0	0	4	3	0	2	3	0	2	1	2	0
Vino de Monte Pulciano	2	6	0	0	3	0	0	2	40	2	8	0	20
Moselle	2	2	0	0	4	20	0	1	30	2	9	0	10
Muscadine	3	0	0	2	4	0	1	0	0	2	5	4	0
Neufchatel	3	2	0	4	0	0	1	7	0	2	2	7	0
Palm Sec	2	3	0	2	4	0	4	4	0	2	2	5	0
Pontac	2	0	0	0	5	20	0	2	0	2	9	0	40
Old Rhenish	2	0	0	1	0	0	0	2	20	2	8	5	40
Rhenish	2	2	0	0	3	20	0	1	34	2	9	1	6
Salamanca	3	0	0	3	4	0	2	0	0	2	3	4	0
Sherry	3	0	0	6	0	0	2	2	0	2	0	6	0
Spanish	1	2	0	2	4	0	9	4	0	1	10	6	0
Vino Tinto	3	0	0	6	4	0	1	6	0	2	0	6	0
Tockay	2	2	0	4	3	0	5	0	0	2	0	3	0
Tyrol Red Wine	1	4	0	1	2	0	0	4	0	2	8	6	0
Red Wine	1	6	0	0	4	40	0	2	0	2	9	3	20
White	2	0	0	0	7	0	0	3	0	2	7	0	0

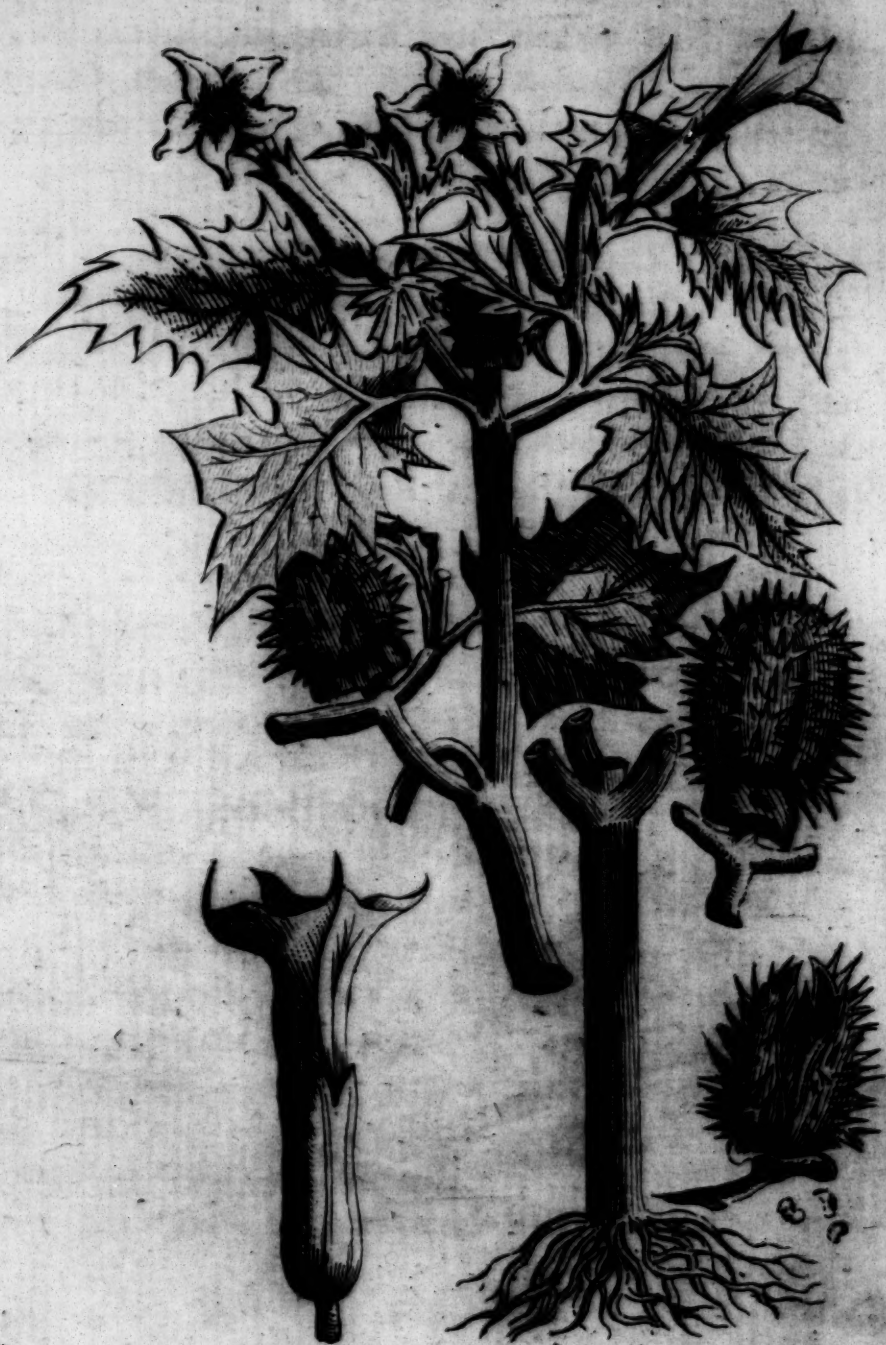
FROM

FROM these experiments it appears that the Red Wines of our own country (the Marche of Brandenburg) contain most water, Malmsey most spirit, Vino Tinto most unctuous matter, and the Spanish the most gummy and saline matter; that this last holds the least water and the least spirit, Champagne the least tartar and mucilage, and ordinary Rhenish the least unctuous matter.

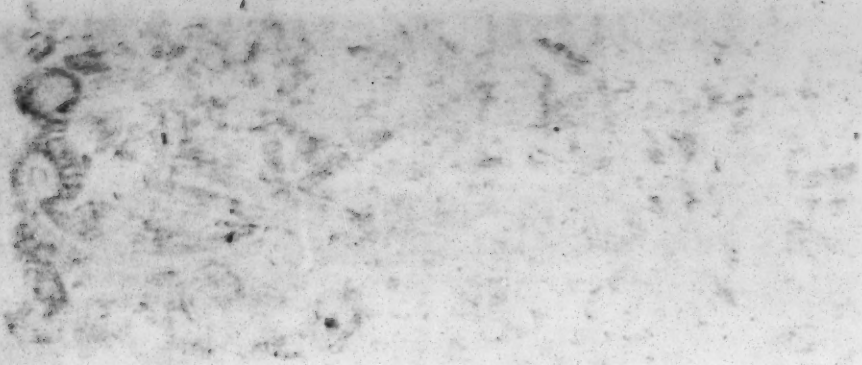
WHEN once the principles of Wine are separated from one another, no art can re-produce Wine by joining them together again: when barely the inflammable spirit has been distilled off, the addition of that spirit to the residuum does not restore its vinosity; the residuum itself often suffers a new separation upon this addition, its tartareous parts precipitating.

WHEN Wines are exposed to the action of freezing air, a part of their water congeals, and the unfrozen part proves proportionably stronger and more spirituous: by repetitions of this process, first pointed out by Paracelsus, and since carried to a greater length by Stahl, the best Wines are reduced to about one sixth of their original volume. Wines thus concentrated, or freed from their redundant phlegm, are no longer the delicate liquors they were before; they are too unpleasant, as well as too strong, to be drank by themselves, and when mixed with other Wines, communicate to them also a disagreeable taint. The phlegm which congeals retains a part of the truly vinous matter, as appears from its being convertible into vinegar; but this phlegm, mixed with the unfrozen Wine, does not restore its pristine qualities: both the phlegm by itself and the mixture soon corrupt.

Stramonium.



Thorn-Apple.



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M. De Reaumur's Extract of several Experiments made
by him, concerning Animal Digestion.

[Read at the Royal Academy of Sciences at Paris, and published with his Approbation.]

MODERN naturalists and physicians rest the business of Digestion on these two queries :

- I. Is it the work of trituration alone ?
- II. Is it brought about by the joint operation of trituration and dissolvents ?

EXPERIMENTS alone must settle the controversy ; and birds, I think, for many reasons, are, of all animal subjects, by far the properest to try them upon.

THE structure of the stomach in birds is as various as their outward forms. In some it is very fleshy, thick, and of a close texture, called gizzards ; others very thin, though of a much larger capacity in proportion to the body, being a sort of membranous pouch : in some the stomach is partitioned into gizzard and membrane ; and lastly, in others it is all over of a middle texture and thickness, between the one and the other.

THE gizzard is the stomach which seems the most favourable to the system of trituration. Its thickness, solidity, and compact texture, lead us to think it destined to act with a mighty force ; and birds that have it are known to swallow sand, gravel, and small flints, with other like stones, some of which are always found within them. Such stomachs there-

fore seem fitted as mills for grinding and braying the grain they eat for food. The experiments of the Florentine academy, repeated by Redi and Borelli, have further confirmed this plausible notion. Hollow particles of glass, which they gave to chickens, ducks, and turkeys, were found reduced to a fine powder.

HOWEVER, Valisnieri, famous for a multitude of fine observations in natural history, and ever ready to oppose popular prejudices, could not rest satisfied in these facts. He looked upon the resemblance between a stomach and a mill as chimerical: he could not but think, with a great many others, that a stomach thus capable of grinding corn, must also grind itself away. He considered the reduction of a glass to powder as the effect of a powerful dissolvent, and found proofs thereof in the stomach of an ostrich, which he judged incontestable. I shall name one in particular; he there met with bits of glass perforated with a vast number of holes more minute than those of the finest silver wire plates.

HAVING myself experienced how easily small glass beads of various sizes and shapes were powdered, without at all excoiating the gizzard, I caused chickens, ducks, and turkeys, to swallow short tubes of glass, which were about five lines in length, and four in diameter, of which the bore was about two lines. These, after the death of the fowls, I found no longer to retain their former shape, for they were all split asunder lengthwise. They had resisted the pressure which acted upon them inwards, from without, which must have been prodigious to have broken them; but they yielded to that from within outwards; for if it is certain that their splitting was the effect of the pressure of some small stones acting as wedges against their extremities, no dissolvent by any conceivable action upon a tube, could have divided it into two nearly equal parts.

I THEN

I THEN got a parcel of tin tubes made, whose small diameters rendered them capable of sustaining much stronger efforts, the diameters of their hollow being, at most part, but a line and three quarters; and, to add to their strength, they were covered a line and an half thick with folder, which also closed up their orifices; they were about seven lines long. I caused a turkey to swallow one of them, to another I gave two, and to a third six at once. When I opened these birds, twenty-four hours after, I could not find a single tube whose solidity had been proof against the force that attacked it. That which had suffered the least was grooved from end to end on two opposite sides, most of the rest more absolutely flattened, and some of them in part unrolled; the little plates that had been firmly foldered to their ends were forced away, some of them being driven into the tubes, and others pushed outwards.

WHAT a mighty resistance must the gizzard have been able to overcome, in flattening these tubes, and producing the other remarkable alterations in their figure? The result of some different trials I made upon the like tubes, may serve in some measure to convey some idea of it. Several of these, for instance, I squeezed between the cheeks of a vice, by hanging weights on the ends of the handle; and it required about four hundred and thirty-seven pounds to flatten them as the gizzard had done.

A LARGE nut with its shell is easily ground to pieces in a turkey's gizzard; and the recipe for flattening them, by giving them one or two a day, is not so ridiculous as may at first appear. I have carried the point so far, as to force four-and-twenty large ones into a turkey's craw at once, where they might be heard to rattle, upon filliping the neck and the outside: next morning they were all gone, having underwent the operation of grinding in the gizzard.

BUT notwithstanding this amazing force, which the gizzard exerts in grinding the aliment it receives, does it not require the assistance of a dissolvent? And is not such a one actually to be found there? The force of the gizzard, great as it is, has its limits; and I have cast lead in moulds, whose shape it could not alter. Into one leaden tube, left open at each end, I introduced a grain of raw barley, with its husk on; into another, a grain of the same husked; and into a third, boiled till it was ready to crack. These tubes continued at least twenty-four hours, and sometimes double that space, in a turkey's gizzard, and the experiment was repeated several times. The grain, whether raw and in its husk, or without the husk or boiled, retained its figure and solidity, without sensible alteration, except perhaps a little swelling, such as it would have acquired in any moist place,

IT is well known how quickly ducks digest flesh food. I caused one to swallow several leaden tubes, in each of which was a bit of raw beef or veal, of the size of a barley-corn. When these tubes were taken out of the gizzard, several hours after, the bits of flesh extracted from them were found no-ways altered, either in smell or consistence, weight or colour.

IT is therefore fairly demonstrated, that if the aliment were not communicated in the gizzard, by grinding, it would not be digested, since no dissolvent exists there capable of dividing it; and that the comminution it undergoes in the gizzard, equal at least to that of corn in a mill, is entirely owing to the action of that viscus. I do not however imagine, that a simple trituration of aliments, like corn milled, is a perfect digestion. To that I think a seasoning of certain liquids is requisite; but I have not now time to explain my idea, much less to recite the facts on which it is founded; nor have I leisure to remove the principal difficulty that has been opposed to trituration; namely, that a stomach which can divide exceeding hard substances must destroy itself; nor to explain the nature of the seeming callous membrane

membrane which lines the gizzard ; nor even to say any thing of the gizzard of a species of Indian pigeons armed with two mills, which seem to be stone, but are really hard horn : I hastened, therefore, to the experiment I have made on the membranous stomachs of birds, of a texture differing in all respects from that of gizzards.

THE partisans of trituration, believing they had sufficiently proved from the texture of a bird's gizzard that Digestion was effected by it, did likewise insist that it was performed purely by the means in the stomach of other animals, even in the simply membranous, as well as in the most fleshy. On the contrary, those who could not be brought to conceive how membranous stomachs could be capable of grinding, would have it, that in such a dissolvent was alone sufficient for the business of Digestion, and that it was also accomplished the same way in the most fleshy stomachs. It is too common a presumption to imagine the laws of nature more uniform than they really are; and notwithstanding it has been well proved that Digestion is done by trituration in gizzards, yet it remains to be made appear that it is brought about by the same mechanism in membranous stomachs.

THOSE of birds of prey are the most proper for affording us information in this matter, especially as they are of the kind nearest in relation to our own : it is true they swallow large morsels at a time, without teeth to chew, in which they differ greatly from the human species ; I was therefore desirous of trying them with variously conditioned tubes ; and this I was aware I might do without difficulty, and even without taking away the life of any one of these murderers.

WHOEVER has looked into books of falconry, must know that carnivorous birds have a faculty of readily rejecting by vomit any thing that their stomachs cannot digest : if they swallow feathers, as they very commonly do, these never digest, nor are they evacuated through the passage of the excrements,

crements, but vomited up; I therefore provided myself with a parcel of tin tubes of about ten lines long, and seven in bore.

A YOUNG buzzard of the largest size, from whom I had plucked some of the quills of his wings to confine him to my garden, was destined to undergo the several trials I judged fit to be made on the carnivorous kind; and the first that was resolved upon was, to make him swallow one of the said tubes open at the ends: their size rendered them incapable of any great resistance; insomuch that they might be squeezed together by the bare pressure of a finger and thumb. The gizzard of a turkey would not only have flatted such a tube, but broken it in pieces: the buzzard, then confined under a hen-coop, vomited it up, after about twenty-four hours, exactly in the same condition it was swallowed, without the least distinguishable mark of any friction it had undergone. This experiment, which had convinced me that if the bird's stomach had any force of trituration, it was extremely weak in comparison of that of a gizzard, induced me to satisfy myself forthwith, if a dissolvent might not there be employed instead of it: I shall mention the precaution I made use of in order incontestably to prevent deception.

AT each end of the tube I fastened a kind of grate, by means whereof the included food was secured from any motion which could possibly be produced in the stomach; so that nothing but a dissolvent could act upon it. All that seemed liable to doubt was, that if a dissolvent did really reside in the stomach, whether it might not be in too small a quantity for enough of it to get into the tube, so as to act successfully. The very slender opinion that my first experiment had impressed upon me of a force of pressure in the buzzard's stomach, made me imagine that a grating of fine linen thread might be sufficient for my purpose; and therefore I took a thread, and applying it according to the length of the tube, wound it round, so that at every turn it passed over the cen-

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ters of the open ends, and formed meshes, which, instead of squares as usual, were circular sectors, pointed at the center, and widest at the circumference of the ends of the tubes, yet so close there as not to allow a free passage to any thing more than of half or three quarters of a line in diameter: the turns which formed the grates, and which I call longitudinal, were kept tight with transverse ones, which formed a sort of girdle about the middle part of the length of the tube.

THE buzzard which I had made to swallow the first tube filled with flesh, and grated at the ends, disgorged it in about twenty-four hours without one of the threads being broken, or put in the least out of its place, or any of the meshes stretched wider. As soon as I cast my eyes on one end of the tube, I was fully convinced of the reality of a dissolvent in this bird's stomach, capable of itself to effect Digestion; for at first view I perceived within a soft, greyish-white paste, a little of which I took out with the point of a penknife, and squeezing it between my fore finger and thumb, found it exceeding tender, resembling the finest clay moistened to an equal degree: I could observe nothing grumous, nor any diversity of colour or consistence that had the least resemblance of the fragments of fleshy fibres. Having by degrees gotten it all out, I found there was as much as about half filled the tube, and I discovered therein somewhat of a slightly redish substance, which had rather a more solid consistence than the rest; it surrounded the remains of the bit of beef, and was nearly of the natural colour; the remaining portion of the beef I washed gently to clear it from the redish parts; and then it did not appear to be above an eighth part of what I had put into the tube.

IN making a second experiment, I took care to weigh exactly the bit of beef to be inclosed in the tube, which was more than forty-seven, but not quite forty-eight grains; this tube,

tube, which had a grating at the ends like the first, remained in the buzzard's stomach almost as long again as any of the others ; for it was not rejected in less than forty-four or forty-five hours. The Digestion of the flesh had time to be more completely performed ; and I made no doubt of finding it so ; upon cutting the thread and removing the gratings, I looked through the tube as through a prospect-glass, and perceived it to be above half empty throughout the whole length, so that it seemed plain that there could not be so much matter in the cavity as I had introduced : the greatest part I found to be a whitish-grey pap, of a much slenderer consistence than the paste of the former experiment ; it was indeed liquid, and so far it is probable part of it might have escaped through the meshes of the grating.

THERE was, however, a small portion of the beef remaining under its first form, but of a much paler hue, and not of so firm a consistence ; it was parted into three so minute morsels, that being washed and gently drained, and then weighed, they were but six grains, or an eighth of the original weight ; they were so very tender, as to manifest an approaching dissolution ; for having put them in the palm of my hand, and worked them tenderly with the top of my finger, as with a pestle, they immediately became like a paste.

IN both the experiments the pap, the paste, and the small portion of remaining flesh, had not the least ill scent of tainted meats ; they only smelled a little faint, but not at all strong.

IT was natural to desire to know how far the powers of this dissolvent could exert itself, whose existence had been sufficiently proved ; and if it were capable of acting effectually upon bones. Those which I first made trial of were of the softest kind, namely of a chicken of a month old, no bigger than a quail ; I filled the tube with six pieces, four whereof were
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of the wings, the other two of the thighs, cut to a fit length for their reception; they weighed all together but twenty-six grains; the tube being grated as before: I made the buzzard swallow it; it remained in its stomach not more than twenty-four hours; after which, upon taking off the grating and looking for the bones, I could not perceive the least remains of them. It seemed that they had undergone a quicker and easier Digestion than the flesh; for there was nothing left in the tube but a little gelatinous substance, most of which adhered to the inside of one of the gratings.

IN another trial I made use of one of the hardest of bones, the rib of an ox; two pieces of which I inclosed in the tube, there was none of the cavernous cellular part about them, but all as compact as ivory, weighing forty grains: these resisted the dissolvent more than the tender ones had done; for after twenty-four hours they had lost but eighteen grains, or about half their weight; each bone had a small drop of gelatinous matter at either end, being, doubtless, part of the substance which had been dissolved; that which remained and these two fragments were not intirely dissolved, that is, they were not reduced to less than four grains, after being twice introduced into the bird's stomach.

THE true carnivorous birds, such as our buzzard, feed only on the flesh of other birds, and that of quadrupeds and reptiles; no degree of hunger will induce them to swallow grain of any kind. Is this because the dissolvent of their stomachs can act only upon flesh and bones, and not upon vegetable productions? Nature has taught animals infallible lessons, such as they most stand in need of, and which they never omit to pursue: it was reasonable therefore to presume, and curious to be satisfied, that this dissolvent in the buzzard's stomach, of such efficacy upon flesh and bones, would fail upon substances of the vegetable kingdom. I have already related an experiment several times repeated, which seems to prove it.

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The thread gratings of our tubes always kept intire without damage to any single twist.

THE tubes, however, indicated very easy means of proving the power of the dissolvent on vegetable substances, which seemed less conditioned to oppose it than strong and dry fibres of plants : I gave several tubes, filled with corns of wheat or barley, to the buzzard, both in the husk and without it, and also boiled ; in others, I put a bit of the crum of bread as long as the tube, and stuck with different grains ; and lastly, one half of another tube was filled with flesh, and the other half with corn. None of these experiments discovered the least alteration in any one grain of corn by the dissolvent ; all came out as they were put in, saving a little swelling, such as would have been from a like continuance in any damp place : the crum of bread seemed to have been a little operated upon, as though it had been chewed ; but it was not converted to a paste, as the flesh was that was included along with the grain.

I HAVE room to think that the dissolvent can operate but little more on fruit than any grain : a piece of ripe orange-pear, weighing twenty-nine grains, after remaining twenty-four hours in the buzzard's stomach, came out unaltered, appearing only a little macerated from the warmth it was confined in ; it tasted somewhat aigre, and had lost only four grains of its weight.

Now, what must be the nature of this liquor, which has the like power on flesh and bones as aqua regia on gold, and can do no more on vegetables than that menstruum can do with silver ? We can scarce hope to procure of this dissolving liquor wherewithal to furnish variety of trials sufficient to discover its several properties ; but our tubes, which have stood us so much in stead in examining into the affair of Digestion, so far can supply us, as to furnish proof enough of its nature. If a tube were filled with sponge, a substance which no bird
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of prey feeds upon, and which, from what has appeared above, his stomach cannot digest, it should seem probable that it would imbibe the dissolvent: in short, I introduced several bits into a tube, taking care not to press them too close together, and grated up the ends; these the buzzard swallowed, and rejected as usual. The sponge, before it was put in, weighed only thirteen grains; but when taken out of the tube, it weighed sixty-three grains; here then was fifty grains of the liquor, which I could easily squeeze into a vessel proper for keeping it. This experiment suffices to shew that we may become masters of a considerable quantity of it. A buzzard may be made to swallow two or three tubes filled with sponge in a day; but if instead of a buzzard, the thing were to be done by a vulture or eagle, it might not be difficult to obtain a good glass-full of the dissolvent.

N° LXXII.

Account of the BATHS of Naples, Pozzuoli (or Puteoli) Baia, and Ischia.

[Translated from the original Italian.]

IT appears, by the eruption of Mount Vesuvius, that the bowels of that mountain, and probably all the adjacent country too, are plentifully stored with sulphur, metals, and minerals; it is therefore no wonder that so many Hot-baths and medicinal springs, strongly impregnated with those substances, should be found in its neighbourhood. The ancient Baths in these parts are mentioned by Pliny and Cicero; in later ages their number amounts to thirty-six; and we are told that formerly a statue of stucco was placed near every Bath, pointing with its finger to that part of its body for the disease whereof the waters of the Bath were proper; and that

the virtues of each Bath were also more fully and particularly expressed by proper inscriptions : but that the physicians of Salernum finding that all the sick forsook them, and resorted to the Baths, they broke the statues in pieces, and defaced the inscriptions ; from which time, to the vice-royalty of Don Pedro Antonio of Arragon, the Baths were greatly neglected ; but that vice-roy caused them to be cleansed, and ordered drains to be made to carry off the superfluous water ; he also opened windows into some to admit the light, and caused stone benches to be cut out in others, for the sick to rest on ; and, which was the most material, he by the help of records and traditions, and by the advice of the most eminent physicians, especially Sebastian Bartolin, in a good measure restored the ancient inscriptions, and caused them to be engraved a-new upon marble in each Bath ; so that the Baths were much embellished, and put into a very good and serviceable condition.

THOSE called the Baths of Naples lie between Naples and Pozzuoli ; the Baths of Pozzuoli between Pozzuoli and Tritola ; and the Baths of Baia are those which lie between Tritola and Monte Miseno.

The Baths of Naples.

THE first Bath, called Tripta by Savonarow, is near the sea-shore, under Pausilypus and over-against Nisida ; its waters are very wholesome, and pleasant to drink ; they strengthen the stomach, and are reckoned good in diseases of the lungs and liver ; but are noxious to hydropics.

THE second is called Guincara, because it is surrounded with rushes ; its waters are supposed to be impregnated with gold and iron : they are invigorating and nourishing, cheer the spirits, strengthen the breast, and are useful in slow fevers, but hurtful to hectic.

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NEAR the sea-shore, at the foot of mount Olibanus, is the third bath. Its waters strengthen weak eyes and weak limbs, and cure dimness of sight and quartan agues.

ON the border of the lake of Agnano, is the famous sudatory of St. German. It is a small room, the floor whereof lies several feet under the surface of the earth, and from a hole in the floor there issues a warm sulphureous vapour, which throws all who enter the room into a sweat; by which means all superfluous and morbid humours are carried off, and therefore it is thought to be very serviceable to those who are afflicted with a gout or internal ulcers.

AT the foot of Monte Sefco, is another bath, called Della Bolla, from its continual ebullition, occasioned probably by subterraneous fire. If the water of this bath be mixed with cold water, the mixture becomes sulphureous, and emits a thick fuliginous vapour. The physicians say it is impregnated with copper and nitre, and is good in all diseases of the eyes, ears, and joints, and cold diseases of the head; and that it attenuates the bile, and strengthens the organs of digestion.

IN the delightful plain or vale of Aistruni, there formerly issued two fountains, or jets of water, moderately warm. The water was thought to be impregnated with copper, sulphur, nitre, and alum. It was nearly of the same quality with the baths of Baden, and was pectoral and anti-rheumatic; but these fountains are now dried up.

IN the part of the road from Naples to Pozzuoli, which lies along the sea-coast near mount Olibanus, if you make a hole in the sand, although it is daily overflowed by the sea, water will issue out so extremely hot, that you cannot bear your hand in it. And at the extremity of the sea-coast road, is a bath, called Ai Pietra, which is used to good effect by persons afflicted with the stone and gravel.

ADVANCING

ADVANCING a little farther, not far from the sea-shore, you meet with a deep grotto, wherein is a bath called Subveni Homini, vulgarly Zuppa d'Huomini. Its waters are nitrous and ferrugineous. They are good in gouty cases, and are anodyne and strengthening. What they call the Arenazioni, are often used here with good success, in cold nervous distempers. The method is to wrap the patient in a sheet, and to make a hole in the sand, and cover up all his body, except his head, with the hot sand, and let him lie a considerable time. The hole is generally made under a tent.

ON the land side of mount Olibanus, is a well called Ortonico, to which you descend by several steps. It is dangerous going down to it when the south wind blows, for then it emits a very offensive noxious vapour. The waters are esteemed restorative and stomachic.

CALCATURA is another bath, the waters whereof fall from a rock; and are reckoned cardiac, pectoral, and exhilarating.

If you dig a hole in the sand near the chapel of St. Anastasia, there will issue a clear limpid water. It is impregnated with copper and nitre; and is very efficacious in the stone and gravel, and diseases of the eyes. Near this place was formerly a bath, called dell'Ajuto; but it is now choaked up.

The Baths of Pozzuoli.

NEAR Monte Nuovo, or the mountain of ashes, thrown up in 1536 by an earthquake, is a bath called Cantarelli. Its waters are impregnated with iron and adamant; are styptic, and good in internal ulcers, and disorders of the uterus.

THE waters of the bath di Fontana, formerly called Forma, are impregnated with nitre and bitumen. They are grateful to the palate, soporific, stop fluxes, increase milk, dissolve the stone, and cleanse the reins; but are noxious to the wounded and gouty.

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NEAR the lake Avernus, were several other baths of the arches; but they were lost at the time of the earthquake, and buried under Monte Nuovo. The bath of Tezipergole, the bath of St. Nicholas, that for the king's-evil and scrophulous diseases, the bath of St. Maria dell'Architello, the baths of the Holy Cross and Sibyl's Cave, used in great variety of distempers, were all lost at the same time.

THERE are, however, three more baths remaining in the neighbourhood of Monte Nuovo: one is a strong chalybeat, the other two are called Palombara and Salviana; the former whereof is diuretic and anti-nephritic, and the latter promotes the menses, and is good in all disorders of the uterus.

The Baths of Baia.

THE bath of St. George is subterraneous, impregnated with copper and nitre, dissolves the stone, and heals foul ulcers.

THE bath di Pugillo is so called from its smallness. Its waters are chalybeat: they stop loosenesses, are good in the hemorrhoids, and are anodyne, strengthening, and astringent.

THE bath of the Sun and Moon is a little bath so called on account of its great virtues. It was formerly called the Emperor's bath. Its water is impregnated with sulphur, iron, and loadstone. It is styptic, drying and strengthening, heals ruptures, abates pain, and relieves the gouty.

THE Bishop's bath, is so called either because it was repaired by some bishop, or because it is much resorted to by bishops, who are generally afflicted with the gout. It strengthens the stomach, excites the appetite, and relieves the gouty.

THERE

THERE are many other baths and springs in the neighbourhood of Baia and Viterbo, which are strongly impregnated with sulphur, nitre, and petroleum, from the roots of mount Vefuvius, and which are beneficial in most sorts of diseases, but to mention them all particularly would be tedious.

BESIDES the baths on the continent, in the isle of Ischia, which lies at a little distance from Naples, and is about sixteen miles round, are no less than thirty-five different sorts of hot baths more, and also several cold medicinal springs and sudatories: so that no part of the world abounds with more medicinal and mineral waters, than the neighbourhood of Vefuvius

The Baths of Ischia.

THE hot baths in Ischia are not less than thirty-five in number. They are impregnated with almost all sorts of metals and minerals, salts and sulphurs, as gold, silver, copper, iron, nitre, vitriol, allum, sal-gem, bitumen, petroleum, &c. which, according to their several qualities, are used internally or externally, for almost all sorts of diseases. They have been resorted to by persons of great distinction, as Donna Geronima Colonna, princess of Monte Leone; the princess of Buttera, Carraffa, and Branciforte! and by the prince of Vaudemont, of the illustrious house of Lorrain, &c. Among the most remarkable of these baths are the three following, viz.

THE famous bath of Gurgitelli: it is supplied by three distinct streams. The waters are strengthening and stomachic, they discuss tumors, dissolve the stone, and are good in diseases of the liver and cutaneous eruptions, and make the barren fruitful. It is said that a piece of a sword, which had penetrated the thorax, and was left in the body of a certain cavalier, was extracted by the internal use and external application of these waters.

NEAR Monte Epomes, upon the margin of a small rivulet, is the Bagno del Oro, or Golden Bath, well worth notice; for if you make a hole in the earth, it will presently be filled with water; and if you wait awhile till it settles, a very thin and impalpable film of gold will rise and cover the surface, which you may take off by gently introducing a sheet of paper under it; if you touch it, it gilds your hand: the film is strongest when the sun shines upon the water. The water is reckoned very cordial and exhilarating.

THE third is a Bath whose waters are so hot that they boil eggs, and are used for scalding the hairs and feathers off fowls and swine; they are good in all diseases of the ears, eyes, and head, and are beneficial to paralytics and epileptics. Bread fopped in these waters is found by the ladies to generate milk, and render it more copious.

THE sudatories or sweating-places are nineteen in number; they are either artificial huts or natural caves, in the floors whereof are several chinks and crevices, from whence arise very warm streams and vapours strongly impregnated with the effluvia of metals and minerals: these sudatories, by the warmth of the vapours and the active virtue of the metallic particles, are very efficacious in curing a great many diseases, and clearing the body of morbid humours.

THE sands upon the coast of this island are in many places strongly impregnated with the effluvia of metals and minerals; in some places they are so hot, that there is no walking bare-foot; hence it is that the arenazioni, or immersions in sand, are practised here with great success: these arenazioni are used generally once a day for fifteen days, or twice a day for seven days, three hours after sun-rise, or three hours before sun-set.

REGIME de Pythagore; traduit de l'Italien du Docteur Cocchi: or, The Regimen of Pythagoras; translated from the Italian of Dr. Cocchi. Printed at the Hague, and sold by Gogue and Deffain jun. at Paris, 1762; containing 188 pages in 8vo, with a plate representing the head of Pythagoras, engraved from a medal which is in the cabinet of the house of Medici at Florence.

THE chief end Dr. Cocchi proposes to himself in this dissertation is, to shew that the Regimen, or manner of diet, so much recommended by Pythagoras, considered as a part of medicine, is very good to prevent and cure numberless disorders that have as yet evaded the joint labours of the most sagacious physicians, and that it is very capable of maintaining the soul in that situation which is the most proper for its contemplation of those objects that are within its bounds, not merely without grief or pain, but even with pleasure.

THE good doctor begins his treatise by proposing Pythagoras as one of the most extensive geniuses that ever appeared: He possessed (says this writer) in a superior degree, what may justly be called erudition, or the art of thinking and speaking properly in physics, or a knowledge of those beings that exist in nature; in fine, civil and political knowledge, such as the science of the laws, or the duties of societies. The particular language which he was obliged to make use of, the small choice of a select number of disciples, to whose improvement he intirely devoted himself, might have rendered him odious, or even ridiculous to those who were excluded from his conferences;

ferences; besides, as he never wrote, but always delivered his dogmas orally, enveloped in metaphors, partly for political reasons, partly through decency or timidity, his doctrine must have suffered vast alterations after his death, and made its appearance under a quite different form: hence, probably, arose those various notions that people have conceived of this philosopher: and hence by some he is represented as the genius or interpreter of nature and the most enlightened of mankind, the best subject, and the best husband; whilst on the other hand, he is by others accused as being a singular, uneasy kind of a man, a declared enemy of sovereign authority and divine worship.

DR. Cocchi, from the writings of Diogenes Laertius, Porphyry, Iamblicus, Plato, Aristotle, and various other authors, fully justifies Pythagoras, giving us the most exalted idea of this eminent man, and at the same time, the most conformable to reason: the virtues and talents of this philosopher are not represented in this treatise in all their due extent: the doctor passes purposely over the useful discoveries and the sublime ideas of Pythagoras in theology, in the system of the world, in geometry, in the wholesome laws of which he has been the founder, his main design being to consider him in quality of a physician, or as one to whom we deservedly owe the greatest discoveries in the healing art.

THE disorders that fall within the physical province may be reduced under two heads; viz. the Acute and the Chronical. The main design of medicine is to preserve the health, as well as to protract as long as possible the fatal period. If a person duly considers the vast knowledge of Pythagoras on this head, we must agree that he was eminently favoured by nature, and that he joined to the most perfect theory a vast practice. To be thoroughly convinced of what is here advanced, we need only to consider, that it is to him we are indebted for the system of the crises; he first observed

the due progress of nature in disorders; he first knew that the morbid matter must be prepared or concocted, and afterwards that it must be eliminated, sometimes by one way, sometimes another, and that for all these different operations a due time is absolutely requisite; that the decisive changes which happen during these operations, manifestly and sensibly fall out upon certain days, as 7, 14, 21, 27, which ought to be sacred days, on which a person's whole attention should be fixed; that the various changes they were to bring about were announced constantly some days beforehand, which days he has likewise evidently ascertained.

THE second part of medicine consists in preserving the health, and keeping it in that state wherein we may perform all our requisite functions with ease, constancy, and pleasure; for this reason it is absolutely necessary to be well acquainted with the essential actions of the animal oeconomy and the effects of the substances destined to keep up the human machine: let us therefore examine a little the vegetable diet he prescribed to his disciples, and we shall clearly see that Pythagoras had the most just ideas of the various effects of aliments in general. This Regimen consists in a free and absolute use of vegetables that are fresh and tender, which require little or no preparation; herbage, roots, seeds, flowers, and fruits, milk and honey, all came within the sphere of this Regimen; eggs were absolutely excluded. Their drink consisted in pure water. Flesh was not absolutely prohibited; he permitted his disciples to eat, at certain times, some select parts of the most tender animals.

IF a person considers but a little the machinery of the human body, he will easily perceive that Pythagoras's principal view was to preserve the health of the body, the vigour of the mind, and a due subordination of the passions by means of this admirable Regimen, which he prescribed to all true lovers of sound philosophy. But let us a while consult the

oracles of physic, and read over the treatises of Juncker, Arbuthnot, Hacquet, and especially the treatise of aliments by Lemery; let us consider the modern discoveries and the most received opinions of the best schools in Europe, we shall be obliged to own that the precepts of Pythagoras promoted admirably the design he proposed to himself; the trifling dreams that have been scattered every where to his prejudice have not the least foundation, and only merit contempt, which is judiciously proved by the eminent physician, the author of this dissertation which is before us.

WHAT proves as yet the great skill of Pythagoras in medicinal affairs is, that he prescribed aliments of a quite different nature, such as hard and dry meats to wrestlers, and to such persons as were willing to acquire an extraordinary strength of body.

THE Regimen of Pythagoras is not only wonderful in preserving the health of the body, but is likewise excellent in curing various disorders (in treating of which numbers of sagacious physicians have failed by following the common course of physic) and in preserving the body in that due state of health so deserving of our most ardent desires.

IN order to conceive the vast benefit derived from Pythagoras's diet in the cure of numbers of disorders, it may be sufficient to remark, that the milk of different animals, such as that of women, cows, goats, asses, mares, &c. are not prohibited; that honey which exudes from the most efficacious plants is permitted; and that he required that each should be in a certain degree of perfection: we are not ignorant of the miracles daily performed by these two remedies, the relief they daily give in the most obstinate and desperate disorders. Is not milk the only remedy for an obstinate gout *? this ob-

* See Med. Museum, p. 85.

servation of the utility of milk in the gout is due to Griessal, physician at Paris; he was subject to this disorder, and found no relief but in the constant use of milk; for which reason he has celebrated the use thereof in a treatise printed at Vienna, 1760, with this title, *De Curâ Lactis in Arthritide*.

WITHOUT entering into a detail of all the disorders that this Regimen of Pythagoras may prevent, we shall mention only the scurvy; are not vegetables, by the unanimous consent of all physicians, deemed the most proper to prevent and even to cure this terrible malady? this is a truth that all mariners experience daily; for which reason, people going to sea would do well to take with them a great quantity of prepared vegetables, such as sorrel, green kidney beans, cabbage, &c. in order to make use of them with the salt beef, of which they make an immoderate use in long voyages. Mustard likewise, differently used, may answer the same indication, but the use thereof must be moderated; it is not to be used indiscriminately in all the different stages of the disorder. Fresh legumes (for Pythagoras's Regimen excludes those that are dry) such as peas and beans, afford a mucus that serves to sheathe the points and abate the activity of the muriatic salts in scorbutic humours, and to hinder their mischievous effects.

DR. Cocchi then proceeds to shew the various succours that a vegetable diet may afford in physic, and after having demonstrated that it may be favourable even to the sensual, exhorts his fellow-citizens to cultivate gardening, to render the different sorts of good legumes more common, and to introduce new ones. He concludes with observing, that it is easily to be perceived what an happy influence it would have on the health of the public, if the great who possess amongst us (in Italy) magnificent country-houses, which so agreeably adorn the hills and other parts of Tuscany, would suffer one part of their glory, after the manner of the ancient Romans, to consist

sist in introducing new kinds of fruits and legumes, in carefully cultivating them, in order that their fellow-citizens of inferior degree may enjoy a little the fruits of their opulence.

WHAT we ought to conclude from this learned treatise of Dr. Cocchi is, that Pythagoras was endowed with the most excellent ideas relative to the animal œconomy; that his rules of living, prescribed only for the lovers of true knowledge and wisdom, and for those who are desirous of preserving the free use of their intellectual functions uninterrupted by passions, is a master-piece, and that it has been unjustly regarded as the effect of superstition, and erroneously deemed a consequence of the system of the metempsychosis.

G E R M A N Y.

[From the Bibliothéque des Sciences.]

II. LEIPSIC: Joannis Theodori Eller, Med. Doct. Borusforum Regi à Conciliis intimis & Archiatri, Class. Phys. Acad. Scient. Colleg. suprem. Med. Coll. Medico-Chirurg. totius regni Præsid. ac Direct. Regior. Exercitat. Med. Primor. &c.

OBSERVATIONES de cognoscendis & curandis Morbis, præfertim Acutis; or, Observations upon the diagnostics and cure of Diseases, particularly those of the Acute kind. By Dr. Eller. Sold by Wolsterdorf, 1762, in 8vo.

IT were needless, in favour of this posthumous work of Dr. Eller, to say any thing more than that it is not unworthy the name of its author.

H A G U E.

DESOER the bookseller has just published a work, intitled, Dissertation sur les Douleurs vagues, connues sous les noms de Gouttes vagues & de Rhumatismes goutteux; laquelle a remporté

remporté le prix au jugement de Messieurs les docteurs regens de l'etroite faculté de medicine de l'université de Louvain, l'an 1763. Par J. P. de Limbourg, docteur en medicine, correspondant de la société royale des sciences de Montpellier : or, A Dissertation upon the flying pains known by the name of vague Gouts and gouty Rheumatisms, which has born the prize, as adjudged by the regent doctors of the faculty of physic in the university of Louvain, in 1763. By J. P. de Limbourg, M. D. and correspondent member of the royal society of sciences at Montpellier.

THE first part of this prize dissertation is intended to ascertain the difference between the vague or flying Gout and the gouty Rheumatism, which are perhaps the same disorder, with the Gout, Sciatica, and regular Rheumatism. The author then proceeds to shew the cause, the symptoms, the prognostics, the progress, the cure, and the most proper remedies to accomplish it, whether procurable in the season or not: to treat, therefore, this subject with accuracy and precision, Dr. Limbourg divides his treatise into two parts. The first turns upon the nature and difference of pains of the joints in general; the second upon the nature, difference, and cure of vague or wandering Gouts and gouty Rheumatisms.



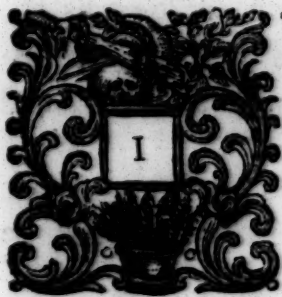
T H E
M E D I C A L M U S E U M.

N^o LXXIV.

Observations on extraneous Bodies retained in the Oesophagus or Gullet ; together with Remarks on such Means as have hitherto been, or may for the future be employed to dislodge them, either by Depression or Retraction. By M. Hevin.

[See p. 368. and 377—396.]

Means to be used for retracting extraneous Bodies stopped in the Oesophagus.



T is generally much more difficult to retract extraneous bodies stuck fast in the Oesophagus, than to convey them to the stomach ; so that it is of the last importance to know the different means which have hitherto been employed, or may be properly used to retract such bodies ; for often an instrument which has been used with success in one case, proves of no service in another.

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THESE different methods may be reduced to four classes; to the first of which we shall refer the fingers and pincers; to the second, the various species of hooks and rings; to the third, the different manners of using the sponge; and to the fourth, the different remedies which may, by exciting vomiting, coughing, and sneezing, procure a discharge of these bodies.

WHEN extraneous bodies are not very far engaged in the Oesophagus, but may be touched, we ought to use our fingers or pincers rather than any other instrument. M. de la Motte * has, in similar cases, often used this method with success. A pin two inches long had stuck in a woman's throat; M. de la Motte could easily touch this pin with his fingers, and thought he had no occasion for any other instrument to extract it; however he found a great deal of difficulty, because the pin was engaged at both ends; he was therefore obliged to push it at one end, in order to disengage it at the other, after which he easily drew it out with his fingers. A footman, who had a middle-sized jaw-bone of a pike stuck in his throat, applied to the same surgeon: the bone was plunged in such a manner, that M. de la Motte thought he should be obliged to use a crow's bill in order to remove it, but having laid hold of it with his fingers, he extracted it by pulling strongly. The same surgeon relates, that he was called to the assistance of a young lady who had half a crown sticking in her throat: he perceived, by touching it with his fingers, that it was strongly engaged; in short, he could neither extract nor depress it; however, at last, by moving it from place to place, he extracted it by his fingers, though not without difficulty, and with great violence.

If the extraneous bodies, though but little depressed, be out of the reach of the fingers, or if the fingers are not suffi-

* Tom. iv. obs. 322.

cient to extract it, we must have recourse to pincers, especially those of the crooked kind, which are of great advantage in similar cases.

A MAN swallowed a pretty long piece of bone, sharp at both extremities; this bone was fixed at the top of the Oesophagus, and several unsuccessful attempts were made to push it into the stomach with a leek: M. de la Borde was called, and examined his throat, but not being able to discover the extraneous body, he introduced a leek, in order to discover its situation; he found it at the lower part of the pharynx, and wanted to dislodge it with the leek; but perceiving that it was strongly engaged in that part, he thought proper to attempt its extraction, and accordingly slipped a pair of pincers to the place where the bone was lodged; he laid hold of it with the blades of his instrument, and jogged it from right to left in order to disengage it; at last, after several half-turns with his instrument in different directions, he extracted the bone; but the patient suffered a great deal in this operation, and there supervened a pretty considerable hæmorrhage, which was, no doubt, owing to the dilaceration of the sides of the Oesophagus by means of the sharp ends of the bone.

LACHMUND * also used pincers with good success in extracting a piece of an iron pin which a child had swallowed, and which had stuck in its throat: for three days various means had been tried in vain to extract this body, and even a violent emetic had been exhibited, but to no purpose; Lachmund at last thought it proper to introduce into the throat crooked pincers, which he, with a great deal of difficulty, plunged as far as the extraneous body, and when he was within reach of it, he seized it strongly in the chaps of his instrument, and pulled it out.

* Boneti Med. Sept. lib. iii. de Oesoph. Affect. sect. 1. cap. 12.

WHEN we cannot reach the extraneous body, either with our fingers or pincers, we must try the other methods we have mentioned. The hook or crotchet seems most proper when these bodies afford hold enough, and especially when they are not very far down in the Oesophagus: it may also sometimes succeed when the body has descended pretty low; of this the Edinburgh Medical Essays give us a proof, which we shall afterwards take notice of, when we have related some examples of the use of this instrument in more ordinary cases.

M. PERROTIN, in an observation communicated to the academy, informs us that a man begged of him to remove a bone which he had swallowed with a spoonful of soup, and which had remained in the Oesophagus: this bone was an impediment to his speech, and produced an intolerable pain. M. Perrotin ordered the patient to be placed in a chair with his head laid backwards; he conveyed his finger as far as possible into the pharynx, but could not perceive the extraneous body: he introduced a crooked silver probe into the Oesophagus, and plunged it to the bone; with this instrument he made several fruitless attempts to push the bone into the stomach. He had recourse to several other means, but the resistance of the bone was so great, that he resolved, instead of depressing, to extract the bone, which was a far better method; for this purpose he formed a hook of iron wire, which he slipped by the side of the bone in such a manner, as by drawing it up afterwards to seize the bone in the crotchet; then ordering the assistants to hold the patient's head very fast, he slowly drew forth the hook, and the bone along with it.

M. PERROTIN was very much surprized at the largeness of the bone, for it was a whole vertebra of a neck of mutton. We may be sure he was not sorry that his first attempts had not succeeded; for it was to be dreaded that so considerable a bone would have stopped in the Oesophagus against the
ringlet

ringlet of the diaphragm, or that falling into the stomach, it could not have passed through the pylorus, or through the canal of the small intestines; at least it is almost certain that it would have been stopped by the sphincter muscle of the anus, and by that means have produced terrible symptoms.

THE same surgeon in a similar case informs us, that he made many attempts to depress a large bone of a cod which was strongly engaged by both ends in the Oesophagus; and that not being able to succeed, he had recourse to the instrument he had so successfully used before: with a slender piece of wire he made a hook like the former, but the bone made so great a resistance that the hook yielded twice; this circumstance obliged him to have one stronger made by a workman; with this he laid hold of the extraneous body about the middle, and though he drew it out very gently, it caused a great deal of pain and an effusion of blood. When it was extracted, M. Perrotin judged by the extremities of the bone, which were tinged with blood, that they had entered very deep into the flesh: he justly ascribes the reason of this to the efforts the patient made to get rid of it, and especially to the frictions which the patient's husband had made on her throat, with a view to make the extraneous substance give way.

THE advantages of the hook to which M. Perrotin had recourse in the two cases we have mentioned, are established on a multitude of observations, in which we see that this instrument has been employed with much success. Riverius* informs us that attempts were made in vain to expel the bone of a hog covered with glutinous flesh, which had fallen into the Oesophagus: a surgeon made a long hook of wire, introduced it pretty far into the Oesophagus, and in retracting it laid hold of the bone, which made a great deal of resistance, but he extracted it by drawing the hook with force.

* Cent. iii. obs. 71.

IT is easily observable, notwithstanding these instances of success, that there is danger in using hooks formed in the manner we have mentioned, because the sharp end of such an instrument may enter and tear the sides of the Oesophagus. M. Petit, a surgeon of Nevers, has communicated an observation to the academy, in which he shews that this accident has really happened.

A CURATE of the diocese of Nevers had swallowed a bone with his aliments; this bone, which probably was sharp, stuck in his throat: as there was nobody in the country to whom the patient could apply, the pain and uneasiness he was in obliged him to send to a small village for the means of relief. He fell into the hands of a person little acquainted with surgery, who undertook to extract the bone by a piece of wire crooked in form of a hook; upon plunging this into the throat, and attempting to extract it, he felt a resistance, which made him imagine that he had laid hold of the extraneous body; he therefore forcibly retracted the hook, but instead of the bone, he brought away a piece of flesh, or rather a portion of the side of the Oesophagus: the wound made by this instrument produced very terrible effects, since the patient was confined to his bed for a year, and was never perfectly cured. The bone, which retained the same situation as before, maintained a very great difficulty of deglutition, and being dislodged some weeks after, fell insensibly into the stomach. M. Petit, with several other practitioners, judiciously observes, that this dislodgment is generally procured by time, as we have already said, in consequence of a caries or putrefaction, which destroys the points or asperities by which the bone is retained.

WE may easily avoid this accident, by forming a hook with a small round or oval button at its extremity, in order to hinder it from pricking or laying hold of the sides of the Oesophagus.

Oesophagus. In fact, we find, in the Edinburgh Medical Essays, that M. Stedman, a surgeon at Kinross, used a similar hook to extract a considerable bone engaged, as we have elsewhere observed, in the inferior part of the Oesophagus. A young man had precipitately swallowed a large fragment of the bone of a cow's head in a spoonful of broth: he made great efforts to make it descend into the stomach, and was almost suffocated before it arrived to about an inch and an half above the cartilago ensiformis, where, towards the left side of his breast, he felt the most intense pain. The author of the observation, who at that time was called to the patient, makes some reflections on the insufficiency of the usual means employed on such occasions, and on the inconveniencies that would have attended an attempt to plunge this bone which had stuck in that part of the Oesophagus where it is straightened by the ringlet of the diaphragm. He quickly determined to get a long, flexible steel probe, terminated by a little round button: M. Stedman introduced this instrument below the part of the Oesophagus where the patient felt the pain; he says, he was obliged to introduce the hook fifteen times, turning it different ways, in order to seize hold of the bone; at last he laid hold of it, and extracted it. This operation was succeeded by some effusion of blood; but the patient had afterwards no other symptoms than such as might depend on the irritation caused by the bone, and by the various attempts with the instrument. The figures of the bone are exhibited in the Essays we have quoted *.

FABRICIUS HILDANUS used a hook that was flat and very large at one end, so that this extremity, whose edge described a somewhat crooked line, formed in some manner a kind of grater or scraper, with which that surgeon loosened the small sharp bodies that were engaged in the sides of the Oesophagus. He also informs us †, that there was brought to him a young

* Tom. i. art. 16. plate iii. fig. 1 & 2.

† Cent. vi. obs. 34.

girl who had a pin of a moderate length engaged across the pharynx, towards the root of the tongue; that he tried to no purpose to take it between his nails, and had no other way to extract it, but with the blunt hook we have described. We find the figure of this instrument in the observations of Hildanus *.

THOUGH we have observed that it is dangerous to use hooks with crooked points, yet there are cases wherein these may be useful, especially when the bodies are large, of so soft a substance that the hook may enter them, and so tenacious that it may be surely engaged in them: such was the large knot of linen before-mentioned; such also we may reckon large portions of membranous and coriaceous flesh, and several other substances. But in such cases the probe must not be too much bent, that its point may be the more easily conveyed into the extraneous body.

IN order to avoid these inconveniencies arising from the point of the probe in the cases we have mentioned, M. Petit has invented one which is formed of a flexible rod, or stillet of silver, or of two silver wires twisted together in a spiral form; the extremity is crooked, and forms a small ring to lay hold of the extraneous body.

STALPART VANDERWIEL † relates, from Nuck, the success of an instrument of the same kind. A soldier in eating some broth swallowed a large bone of a very irregular figure; he tried to make himself vomit, but to no purpose, though he took a great deal of oil, which made the bone descend much lower; this dislodgment of the extraneous body exposed the patient to imminent danger of suffocation for an hour; the surgeon who was called had no instruments, so that the patient was obliged to make one himself with a large

* Tab. xiii. fig. 7.

† Cent. ii. part i. Schol. in obs. 21.

piece of iron wire, which he plated, except in the part of the curvature, where it formed a sort of oval ring sufficiently large to engage the bone; this he himself introduced into his Oesophagus, and at the sixth attempt he succeeded, and in an hour and a quarter after the accident happened laid hold of the bone, which he extracted with much pain and many efforts, for the bone lacerated the Oesophagus, and produced bilious vomitings and a considerable hæmorrhage. The figure of this instrument is represented in Stalpart Vanderwiel.

M. PETIT has also with the same view invented an instrument, the success of which is much more certain on account of the multiplicity of rings with which it is furnished, and one or other of which may apply itself to the extraneous body, and lay hold of it: this instrument is formed of a rod of flexible silver or whalebone, to the extremity of which several small rings are attached, so that they may present themselves on all sides to the surface of the sides of the Oesophagus.

M. DE LA HAYE used an almost equivalent method of extracting a pin from a woman's throat: many attempts were made to extract this foreign body, but none of them succeeded; and the different means used only augmented the patient's pain. M. de la Haye informs us that he was greatly perplexed with respect to the choice of the instrument he ought to use, because several had before been tried in vain; but at last he invented a particular one, which succeeded. He took a long and very flexible silver probe, which was the longest of his algalies, through the ring at the end of this probe he passed several pretty fine threads, and formed several loops all along these threads: when he had introduced this probe into the Oesophagus beyond the extraneous body, he retracted it gently, turning it from left to right in order to secure the pin in the loops formed by the thread; and this ingenious expedient had all the desired success.

* Tab. xiv. fig. 3.

IT is easily observable that the instrument used by M. de la Haye must be very commodious, especially when it is required to extract small bodies, such as fish-bones, needles, and pins; for the ring at the extremity of the probe, though furnished with thread, is but of a very small compass, and consequently easily introduced into the Oesophagus, and passed by the side of the extraneous body without any danger of dislodging or depressing it, which may happen with the sponge. This instrument has still another advantage, which is, that when we retract the probe, the thread, by pulling it against its natural grain, is enlarged, and gently touches all the sides of the Oesophagus, by which means, and by turning it different ways, it may lay hold of small and smooth bodies lodged in that canal.

WE must, when we use this instrument, make a small hook on the extremity we hold in the hand, lest the probe should escape from our fingers, and fall into the Oesophagus: this is a just caution, since it has often happened that probes, and other instruments of a similar nature, have slipped from the hands of surgeons, both in probing such wounds as have penetrated into cavities, and in conveying such instruments into the throat; as it happened in the last case to the barber, who in examining a woman's throat let the instrument fall into the Oesophagus; this body, which was eight inches long, fell into the stomach, and produced such terrible symptoms as proved mortal.

THE deceased M. Marechal supplied the defect of these instruments by another which was at hand, and which, though much more simple than the others, yet succeeded very well. A man swallowed a very large bone of a pike, which stuck in his throat; M. Marechal, who was ready to mount his horse, and who had no other instrument than a whip in his hand, made a loop on the cord at the end of the whip, which he dipped in oil, and introduced into the Oesophagus beyond the
extraneous

extraneous body, which he had laid hold of in the loop, and extracted it forthwith.

To the fourth class of means used for extracting extraneous bodies, we have referred the different manners of employing the sponge: this method is principally expedient in cases where the extraneous bodies possess not a large space in the Oesophagus; for in order to succeed, it is necessary that the sponge should slip by the side of the body, and pass beyond it, that it may extract it when drawn back. Thus we ought always to take our measures, as much as possible, from the largeness of the extraneous body, in order to make the piece of sponge only of such a bulk, as that it may easily pass beyond the extraneous body: we ought also to use a very dry sponge, according to the observation of some authors *, and to let it remain for some time, if the patient can endure it, that it may by the humidity be so distended as to fill the diameter of the Oesophagus. It is easy to conceive how useful this precaution must be to the success of the operation.

M. BROUILLARD informs us that a peasant in eating some soup too greedily, swallowed a large pin, which stuck in his Oesophagus; it forthwith produced a violent pain, which was succeeded by an inflammation and fever: a surgeon in the neighbourhood being called, in vain used a wax-candle and other means, in order to make the body descend into the stomach; M. Brouillard being called, conjectured, from all the means tried, that the pin was so situated that it could not be conveyed to the stomach; and that on the contrary, it was necessary to extract it: for this purpose he took a piece of sponge about two inches long and one inch thick; about the middle of this he had a very long and thick waxed thread; he separated the two ends of this thread, and passed one of

* Platerus, Bonet. Polyalth. lib. iv. cap. 3.

them into the canal of a thick leaden probe, and placed the other externally along the side of the probe; by drawing these threads he exactly secured the piece of sponge against the extremity of the probe; he dipped this sponge in oil of sweet almonds, and plunged it into the Oesophagus by means of the probe: when he understood, by a sign which the peasant made, that it had passed beyond the extraneous body, he kept the sponge in its place by means of the thread, which was free; he retracted the probe, united the threads, twisted them about his hand, and strongly extracted the sponge, which brought the pin along with it. This operation was very painful to the patient, who had like to have been suffocated during it; but the expedition with which it was performed, delivered him very soon from the danger in which he was: he discharged a great deal of blood; but a few venæsections in a short time dissipated all the symptoms.

THIS observation seems susceptible of some reflections; for it seems that the leaden probe used by M. Brouillard is attended with fewer advantages than the whalebone generally used in similar cases; but perhaps M. Brouillard only used the leaden probe for want of the whalebone. It is, however, proper to observe that the whalebone is always more sure than the leaden probe, because it is more flexible: we do not find this advantage in the leaden probe, because it has neither that strength, nor that elastic suppleness which can accommodate it to the canal of the Oesophagus in the different motions or efforts, without being bent into an improper figure, or even perhaps without breaking; since it has frequently happened that such probes have broke in the bladder, where they are not exposed to so violent motions.

WE may also remark that oil does not seem proper for being put on the sponge, because it may hinder the sponge from imbibing the humidity it may find in the Oesophagus, or
which

which may be conveyed to it after it is introduced, by making the patient swallow water, which practice has often succeeded, and is recommended by several authors*.

WE ought also to attend to the manner of fixing the sponge, because by tying it with the thread it is hindered from imbibing the humidity and being dilated; it would, therefore, be better to pierce the sponge in several places with the thread, so as to fix it securely to the extremity of the whalebone.

I AM also of opinion that, in order to reap the greater advantage from the distension of the sponge, and to introduce a larger portion of it with the greater ease, it would be proper to include it in as small a bulk as possible, and set it at liberty when it is beyond the extraneous body: we may in this case expect that the sponge, becoming three times larger than at its introduction, may more surely carry off the extraneous body.

THE covering which is most proper, and with which the surgeon is generally provided, is a bit of gold-beater's skin, very fine and somewhat moistened; this is to be laid on the sponge when very dry, and well compressed: there must be in this skin one or two long and strong threads, the ends of which are to be twisted about the extremity on which the sponge is fixed; when this sponge is introduced beyond the extraneous body, we are to pull the threads so as to tear or displace the skin, and by that means set the sponge at liberty. We may, if we think proper, and if it is possible, make the patient swallow some water, that the sponge may be the more distended, and consequently bring away the extraneous body more surely: but in this case I am of opinion that a flexible wire of iron, tin, or silver, such as that used by some practi-

* Platerus, Bonet. Polyalth. lib. iv. cap. 3.

tioners,

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tioners *, or a hollow probe, like that used by M. Brouillard, would be more proper than any other instrument which might hinder the deglutition of the water.

WE may, instead of the skin, use a very fine silk ribbon, wide enough to cover the sponge; this ribbon must be wound once or twice very tight about the sponge, and once about the splint, and its end secured with the finger on the iron wire, for fear it should be relaxed: when the sponge is introduced into the Oesophagus, and passed below the extraneous body, we are dexterously to remove the ribbon from above the wire, and afterwards draw it strong enough to displace the ribbon from above the sponge, by which means the operation is performed.

THE ribbon may also be attended with another disadvantage, especially when we are to manage small bodies, such as needles and pins, which prick and exasperate the sides of the Oesophagus; for the motion communicated to it in disengaging it from the splint and sponge, may displace or pull off these bodies, and make them fall on the sponge, which will afterwards bring them away. If at the first attempt we fail to bring away the extraneous body, we must make a second, or even a third or fourth, using each time a larger sponge; these reiterated efforts ought not at all to frighten us, since we have before seen, from many examples, that the most celebrated surgeons have with other instruments been obliged to employ a great deal of time, and repeat the same operations over and over.

WE ought always, if possible, to use new sponge, because that which has been often wetted, usually becomes hard, and is therefore less proper to be compressed into a smaller bulk;

* Job à Meeckren, Obs. Med. Chirurg. cap. 13. Mangeti Biblioth. Chir. de Cuttur. Affectib. Fabric. Hildan. cent. i. obs. 36. Vendelius Boneti Med. Sept. de Oesoph. Affect. lib. iii. cap. 9. Raigerus, idem, cap. 7.

whereas that which is new is very supple, and may be easily confined: however, if new sponge cannot be had, we must soften the old by soaking it frequently in water, and then strongly expressing it.

ALMOST all authors who have wrote on this subject prescribe a method of using the sponge, which appears convenient enough in cases where the design is to make the patient swallow some water, in order to distend the sponge: this method consists only in fixing the sponge to a sufficiently strong thread; but I hardly believe that this design can be put in execution, unless we should use the method employed by M. Brouillard to cause the sponge to be conveyed into the Oesophagus, when it is obstructed and irritated by any angular or acute body.

MOISTENING the sponge in order to inflate it, a precaution which I believe useless when the sponge is used in the manner we have mentioned, can at best be only used when the extraneous body is of such a bulk as to make such a resistance to the return of the sponge, as is sufficient for its displacing and removal; for when the extraneous body is small and smooth, such as needles and pins, a wet sponge would slip more easily over these bodies than one that is dry; so that in this case our method of using the sponge must be very advantageous.

To be the better assured of the success of the sponge, we may, by means of four splits of whalebone, keep it more strongly dilated; for this purpose we must cleave the end of the whalebone to which the sponge is to be fixed into four branches, which are to be separated and kept asunder by a piece of brass wire or a large thread, to be interwoven with the branches near the part where they unite: four holes are to be made in the sponge for receiving these four branches, to which the sponge must be fixed, and fixed in each of them by a small notch or groove made for that purpose. Contract these
branches

branches and the sponge, as we have said, in order to introduce them into the Oesophagus beyond the extraneous body, after which we must let them loose, that the branches before straitened may separate by their spring, and keep the sponge strongly dilated: these branches must not however be too stiff, lest they should by their separation wound the Oesophagus. We may also, when we are to extract pins, fish-bones, and other similar bodies, affix to the whalebone several loops of thread, of different lengths, joined to each other, and which will descend round the sponge: they are to be included with the sponge, when we intend to introduce it into the Oesophagus. If it is necessary to this introduction that the sponge and branches of the whalebone should be compressed into a very small compass, we must use a very coarse and porous sponge, capable of compression to the eighth part of its bulk. But in this case it is necessary that the branches of the whalebone should be pretty strong, in order to secure the effect of this sponge, which is of itself incapable of making any great resistance.

VANHORNE *, and most of the modern physicians, for the reasons already given, prefer a split of whalebone for conveying the sponge into the Oesophagus: this instrument is thought to have been invented by Willis † for the following case;

A CERTAIN man had for a long time been subject to throw up almost all his aliments, whether liquid or solid, soon after he had swallowed them: he used various remedies to no purpose, till at last, being overpowered by hunger, he eat till his Oesophagus was filled up to the pharynx. But the superior orifice of the stomach not giving passage to the aliments he had eaten, he soon threw them up: Willis, to whom the

* *Spongia officinæ balneæ per se satis flexili alligata, Micro-Technæ, sect. 20.*

† *Pharm. Rat. par. i. cap. i. sect. 2.*

patient applied, conjectured either that there was a palsy of the inferior part of the Oesophagus, or that a tumor compressed the mouth of that canal. As the patient was ready to die of inanition, Willis had recourse to this expedient, which succeeded: he made a long, small, and very flexible split of whalebone, to the end of which he firmly tied a piece of a sponge with a thread. As soon as the patient had taken some food, he introduced this instrument into his Oesophagus, and by that means removed the obstacle at the superior orifice of the stomach, and facilitated the passage of the aliments into the cavity of that organ. The patient had used this instrument sixteen years at the very time Willis wrote this observation. We find a like case in the observations of Stalpart Vanderwiël *.

SAMPSONIUS † also used a split of whalebone in an almost similar case, though without success: a woman who had for a long time been afflicted with a great difficulty of deglutition, came to him for relief. This practitioner, in order to discover the cause of the disorder, introduced a long and flexible piece of whalebone into the Oesophagus, in which he found an obstacle that the instrument could not surmount, though he repeated his attempts several times, and used considerable force: a few months afterwards the patient died of hunger. Sampsonius on opening her found the canal of the Oesophagus cartilaginous from the region of the clavicles to the stomach: the diameter of this canal would hardly admit a hog's bristle.

THE reader may see Willis's instrument in Heister's Surgery, table xxi. fig. 10.

* Cent. ii. part i. obs. 27.

† Miscellan. Curios. ann. 1613. obs. 170. & Boneti Med. Sept. de Oesoph. Affect. lib. iii. sect. 1. cap. 1.

SEVERAL practitioners use a catheter, to which they fix a sponge in order to extract bodies which are not deeply engaged in the Oesophagus: this method may be disagreeable to those who reflect on the use to which this instrument is generally applied; but in order to prevent this disgust, we may cover it with a roller or small ribbon, which will so conceal it as to hinder it from touching any of the parts immediately.

THIS instrument, as we have before observed, can only be used in cases where the bodies are not far depressed in the Oesophagus: for this reason Fabricius Hildanus, who sometimes used this instrument, was obliged to have recourse to that which he says was invented by Gautier Herman Ryff *, a celebrated surgeon of Strasbourg, and which may however be ascribed to Arculanus. It is true the instrument of Arculanus was lead, and that of Ryff copper. Fabricius Hildanus perfected this copper instrument, which has been since generally adopted; this instrument is a crooked canula of copper or silver, as large as a swan's quill, about a foot and an half long, pierced with several holes all along, and furnished at its extremity with a small piece of new sponge firmly secured. Fabricius † has made several very essential improvements on this instrument; for, first, the canula invented by Ryff terminated in a kind of point; so that it might have been conveyed into the glottis, and perhaps have suffocated the patient, who on such occasions is in great agitation, or at least it might have irritated or wounded the membranes of the mouth or of the Oesophagus; but Fabricius ordered his instrument to be made blunt at the end. Secondly, Ryff put no sponge at the end of his instrument, whereas Fabricius fixed a sponge on it, because he knew that it greatly facilitated the introduction of the canula into the pharynx above the epiglottis, and that it was particularly proper more surely to depress or retract fo-

* Chirurg. Magn. Gualtheri Ryff, Ling. Germanic. conscript.

† Cent. i. obs. 36.

reign bodies lodged in the Oesophagus. Thirdly, the instrument of Ryff was hollow and weak, on account of the quantity of holes with which it was pierced. When Fabricius used it to displace a bone which stuck in the Oesophagus, it happened that the patient, who had strong convulsions, shut his teeth with violence, and bruised the instrument, which, as Fabricius well observes, might have been broken, and the portion engaged in the Oesophagus falling into the stomach, might have produced terrible symptoms. These considerations induced this great surgeon, with a view to render this instrument stronger, to put into the hollow of the canula a large copper or brass probe, well fixed, and leaded at both extremities, in such a manner, however, that this probe, though pretty large, did not fill up the holes of the canula, whose use is to receive and lay hold of small extraneous and acute bodies. We may see the figure of the instrument, as reformed by Hildanus, in the observations of the author *, in Scultetus's Arsenal of Surgery †, and in Mangetus's Biblioth. Chirurg. ‡.

NOTWITHSTANDING the success of Fabricius, and most other practitioners who have followed him, whether in extracting bodies which only possessed a part of the Oesophagus, or in depressing to the stomach such as blocked it intirely up; yet this instrument had still the misfortune to be inflexible, and consequently could be of no use when these bodies are lodged in the inferior part of the Oesophagus. This imperfection has induced M. Petit to invent another instrument, which may answer in all cases: it is also formed of a silver canula, with a piece of sponge fixed at its extremity; this canula easily accommodates itself to the figure of the part into which it is introduced, because it is made of a silver wire turned like a spiral, which renders it flexible in all its length. When we intend to use this instrument, we put into the canula a piece of whalebone proportioned to its length and dia-

* Tab. xiii. fig. 5.

† Fig. &c.

‡ Tab. xxviii. fig. 5.

meter, in order to give it that strength which is necessary to answer the end for which it was designed; the whalebone is longer than the canula, and that extremity which does not enter it is larger, that it may serve as a handle: the whalebone being thus adapted, is secured in the canula by two small hooks at its extremity, which enter into two grooves in the handle of the whalebone.

THERE is a remark necessary to be made with respect to the sponge fixed on the extremity of the two last-mentioned instruments; I mean those of Hildanus and M. Petit. It is customary to leave them furnished with the sponge, to be on all occasions ready for use; but two inconveniencies may arise from this; the former is, that the sponge having been wet becomes hard; in this case it cannot easily be brought into a small compass when we want to introduce it with ease, nor be sufficiently dilated, when we set it at liberty for the augmentation of its bulk, in order to bring away the extraneous body securely.

THE second inconvenience, which is still of greater importance than the first, is, that the thread which fixes the sponge to the canula rots, when it has been wet several times, and dried slowly; thus it may break during the operation, and permit the sponge to fall into the stomach. The best method of preventing this inconvenience, if we want to keep the instrument mounted with sponge, without dreading the putrefaction of the thread which retains it, is, to pass a brass or silver wire through the whole length of the sponge, and by that means secure it to the canula.

It is also highly proper to make young surgeons observe, that when they convey into the throat any instrument proper to extract or depress any body engaged in the Oesophagus, they ought to introduce it with a great deal of precaution for fear of making it enter the glottis, and perhaps suffocate the patient, who on these occasions is generally under great agitation.

tation. Meeckren* informs us that this accident happened in his time to a surgeon but little acquainted with anatomy, and that it produced very terrible effects. In order to avoid this inconvenience, we must slowly and dexterously conduct the instrument along the root of the tongue, and above the epiglottis, carrying it towards the posterior and inferior parts of the pharynx, and make it pass into the Oesophagus; we must pass it by little and little along that canal, leaning gently on the side of the vertebra till we are come at the extraneous body we intend to dislodge. When the instrument is sufficiently introduced, we are to throw the whalebone somewhat to one side, in order to leave the epiglottis free, and not to confine it in its motions. It is also to be observed, that the whalebone ought to be no larger than to be strong enough to convey the sponge into the Oesophagus.

WE shall not here speak of several other means which are generally used to depress and extract foreign bodies, and which have sometimes succeeded, as we shall elsewhere see; such are, the leek, the wax-candle, and other bodies, because when the indication to extract these bodies is determined, and when we want to avoid the danger of depressing them, we do not think it expedient to have recourse to these uncertain and fallacious means.

HOWEVER, when in a pressing case we are destitute of the instruments peculiarly destined to extract foreign bodies, we may use the means which occur most readily, since these have frequently succeeded. Blows of the fist on the neck, recommended by some authors, frequently produce happy effects.

A YOUNG girl swallowed a large pin, which stuck a little below the pharynx, and produced very intense pains; as she could not speak, she made her mother understand by signs that she had an extraneous body in her throat; the mother

* Obs. Med. Chirurg. Posthum. cap. 13.

gave her a severe blow between the shoulders, which drove the pin into the mouth, so that the patient was forthwith delivered from that body which so much incommoded her.

WHEN all the mechanical means before-mentioned are not sufficient for the extraction of foreign bodies from the Oesophagus, we have still another expedient which may succeed; especially, as several practitioners have observed, when the stomach is considerably full of aliments: this last method consists in exciting a vomiting, either by putting the finger or the bearded end of a quill into the throat, or by making the patient swallow oil, or a common emetic.

GRUELINGIUS * informs us that a young man at a feast eating red cabbages, a small bone concealed in them stuck in the Oesophagus: the author being in company, and forthwith perceiving the accident, struck the young man strongly on the neck, as nurses do when their children have swallowed any pieces of aliment which stick in their throats; but this conduct did not succeed, and the patient remained in the same condition till next day. Gruelingius, who during the night had probably reflected on the most proper method of relief, in the morning examined the patient's throat, to try whether he could discover and extract the bone; but he did not succeed: he then made the patient swallow several glutinous and liquid substances, in order to convey the extraneous body into the stomach; but all these proving ineffectual, he exhibited a vomit, which threw up the bone.

THE Oesophagus is sometimes so stopped up that it is not possible for the patient to swallow a vomit: M. Mogniot in a similar case successfully used a clyster of tobacco to excite a vomiting. A man whose teeth were almost intirely lost, swallowed a large piece of lamb's lungs, which stuck in the middle of the Oesophagus, and so exactly shut up the passage of

* Cent. xii. obs. 20.

liquid aliments, that the patient threw them up as soon as he had taken them: a surgeon being called, in vain tried all the ordinary means used to dislodge foreign bodies; such as the fingers, the leek, and a wax-candle; he also gave him an emetic, which could not pass into the stomach, because the passage, as we have observed, was intirely shut up by this spongy body. M. Mogniot being called on the third day, found the patient ready to be suffocated, for his face was black and tumefied, and his eyes starting, as it were, out of his head; he also fell into frequent syncope, which were succeeded by convulsions: M. Mogniot seeing the patient in this extremity, and reflecting on the little success of the means before employed, did not think it expedient to repeat them; he therefore gave the patient a decoction of an ounce of pigtail tobacco by way of clyster, which procured a vomiting so violent as to make the patient throw up the extraneous body, which, without this speedy relief, would have proved mortal to him.

THE remedies we have mentioned may also be used for expelling foreign bodies which have entered into the arteria trachea. When a body, even of the smallest size, passes into the larynx, very considerable symptoms forthwith happen: the patient feels an acute and pungent pain, he speaks with a great deal of labour, and his voice is hoarse; his respiration is also so difficult, that he is in imminent danger of suffocation. But the first symptom which appears is always a violent and frequent cough, and other turbulent motions, which sometimes facilitate the discharge of the extraneous bodies, especially when they have not slipped very far into the larynx; we have examples enough of this in observation.

MOST authors, both antient and modern, the better to procure a discharge of these bodies, order us to excite sternuta-

* Orvald. Gabelchover. Obs. Schenk. lib. xi. obs. 1. Donat. Histor. mirab. Medic. lib. iii. cap. 7. Boneti Med. Sept. de Oris Affect. lib. ii. sect. 9. cap. 2. Sengert. Prax. lib. ii. p. 2. cap. 1. p. m. 142.

tion, coughing, and even vomiting, and to strike the patient frequently on the neck and back. *Ætius* * advises to make the patient swallow four liquors, and to blow a sternutatory into his nostrils. Some other ancient practitioners in this case also recommend acrid substances, capable of irritating the fibres of the throat, and by that means exciting a cough.

FABRICIUS HILDANUS † says, and I think very justly, that we ought to abstain from acrid medicines capable of exciting a cough; for, says that practitioner, the cough comes of itself, and the acrid substances, by contracting the *arteria trachea*, oppose the discharge of extraneous bodies. *Hildanus*, on the contrary, advises with all expedition to give the patient oil of sweet almonds and lubricating syrups, such as those of liquorice and marsh-mallows: he also orders us to blow into the nostrils some pepper, or the powder of *euphorbium* or white hellebore, in order to excite a sternutation.

In practical authors we find some examples of the success of expectorating medicines, sternutatories, and emetics, on occasions of this nature.

HAGENDORN ‡ informs us, that a girl eating plums swallowed one of the stones, which unfortunately fell into the trachea, by which means the patient was in immediate danger of suffocation: her voice was weak and hoarse, and she discharged a great deal of phlegm mixed with blood. Immediate recourse was had to oleous and expectorating, and even to emetic remedies, but all without any success; at last she had a very acrid and stimulating remedy exhibited, which excited a very violent cough, and facilitated the discharge of the stone from the trachea.

* *Chirurg. Franc. d'Alechamp. chap. 32. annot.*

† *Cent. i. obs. 36.*

‡ *Bonet, Med. Sept. de Oris Affect. lib. ii. sect. 9. cap. 2.*

RIEDLINUS * also gives us the history of a young man into whose mouth a person, from a very considerable distance, had thrown a pea, which slipped into the larynx; this body forthwith produced a great difficulty of respiration and a very violent cough: he was ordered directly to take a large dose of oil, which made him vomit, and expelled the pea.

THE same author † also speaks of an infant who swallowed a bone which fell into the trachea: Riedlinus came seasonably to the assistance of this infant; for he strongly blew powder of lily of the valley into its nostrils, which excited a sternutation so violent as to expel the bone.

MUYS ‡ and Verduc § also order us to excite sternutation, and even vomiting; neither does this last author forget the use of volatile and diaphoretic remedies, which in these cases he thinks proper to determine the animal spirits to flow copiously into the muscles of the larynx, in order to expel the extraneous bodies lodged in it. Verduc § also proposes to make the patient swallow oil of sweet almonds and boluses of fresh butter, because these, by softening and lubricating the passages, may facilitate the discharge of the extraneous body, during the efforts the patient makes to expel it: but if these oleous and unctuous remedies are not sufficient, he orders us speedily to have recourse to emetics, to excite more violent and more repeated efforts. Fat and unctuous liniments, applied to the back along the trachea may also, according to the same author, be of use in order to soften the muscles and cartilages, and facilitate the discharge of those bodies which are ready to suffocate the patients.

* Bonet. Med. Sept. lib. vii. Paralipom. ad lib. ii. sect. 7. obs. 1.

† Ibid. Scholion.

‡ Obs. Chir. dec. vii. obs. 9.

§ Pathol. Chirurg. tom. ii. cap. 25.

§ Ibid. cap. 26.

To the Authors of the MEDICAL MUSEUM.

GENTLEMEN,

THE Aphtha or Thrush of infants is a disease so well known, and described by so many authors, that I need not give any description of it here *: it very frequently happens to new-born children, and is often dangerous, when improperly treated, or neglected at the beginning.

I SEND you the method of cure that I have used for fourteen years, and have not lost above one patient in thirty; and I am convinced from experience of its being more successful than the ordinary course of testaceous powders and gentle cathartics, which I used for some years before:

R Magnes. alb. de Pharm. Edinb. ʒj. ad ʒij.

Fiat pulvis, pro dose, & fiant doses hujusmodi x.

Sumat unam ter die in cochleare lactis.

Or, R Magnes. alb. de Pharm. Edinb. ʒ fs.

Ol. ess. cinnam. guttas vj.

Misce, fiat pulvis in xij. chartas dividendus.

Capiat unam ter die in cochleare lactis.

If the disease has been of three or four days standing, I give to the nurse likewise Cret. alb. pulv. drach. fs. ter die.

I am, GENTLEMEN,

Whitehaven,

Your very humble Servant,

22 Sept. 1763.

T. AERY, M. D.

P. S. The method of cure that I have recommended is for the genuine Aphtha, not the symptomatic.—“Aphthæ symptomaticæ medela ad ipsum morbum primarium applicata curantur.” Home’s Principia Medicinæ, p. 309.

* See Smellie’s Midwifery, p. 441. Home’s Principia Medicinæ, p. 308.

A further Account of the Case of the Family at Wat-
tisham in Suffolk, whose Limbs mortified.

In a Letter from Charlton Wollaston, M. D. F. R. S. to
Thomas Birch, D. D. Secretary to the Royal Society.

DEAR SIR,

Pall-mall, Oct. 29, 1762.

DR. Heberden some time since communicated a letter from
me, giving an account of a most remarkable mortifica-
tion of the limbs which had affected a whole family in Suffolk.
As the Society may be curious to know some further particu-
lars relating to this singular calamity, I thought it might not
be improper to acquaint them that most of the unhappy suf-
ferers have survived it.

THE father is perfectly recovered, except that the two fin-
gers which were particularly affected, remain in some degree
contracted.

THE mother is still alive: in my former account, dated
April 13, I mentioned that one of her feet had separated at
the ankle, and that the other leg was perfectly sphacelated to
within a few inches of the knee, but not then taken off;
some little time afterwards the husband broke off the tibia,
which was quite decayed, about three inches below the knee;
the fibula was not decayed, so the surgeon sawed it off. The
stumps of both legs still continue unhealed; and as the ends
of the bones in both of them seem to be carious, and the
woman will not consent to any farther operation, they may
perhaps never heal. The mortification, however, has not in
this limb, nor indeed in any one of these cases, spread beyond
the original separation: her right arm is considerably wasted,
and the fingers contracted.

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THE eldest girl, Mary, died within a few weeks after I saw her.

THE second girl, Elizabeth, is perfectly well; the sores quite healed.

THE third girl, Sarah, is not yet well; her foot separated at the articulation of the os scaphoides with the astragalus; the os calcis and astragalus are both of them carious, and probably keep the wound from healing.

THE two boys are perfectly recovered, and seem in every respect as healthy as possible.

I HAVE taken all the pains I could to inquire into the cause of so remarkable a disorder; and Mr. Bones, the minister of the village, who knew the family before this misfortune happened to them, and has ever since been indefatigable in his attention and tenderness to them, has also made all the inquiry in his power; but we have not been able to find that there was any thing particular, either in their diet or manner of life, to which it could be attributed. The corn with which they made their bread was certainly very bad; it was wheat that had been cut in a rainy season, and had lain on the ground till many of the grains were black and totally decayed: but many other poor families in the same village made use of the same corn without receiving any injury from it. One man lost the use of his arm for some time, and still imagines himself that he was afflicted with the same disorder as Downing's family; but by what I could learn from him, there seemed to be no reason for this supposition: he is, long since, perfectly recovered.

I am, S I R,

Your most obedient, most humble Servant,

CHARLTON WOLLASTON.

N^o LXXVII.

**A further Account of the Case of the Family at Wat-
tisham. By George Parsons, Surgeon.**

The manner in which these unhappy objects appeared to me
on the 8th of April 1762.

1. **JOHN DOWNING**, forty to fifty years of age, lost
the use of both his hands for some time, which reco-
vered, and two fingers of his right hand ulcerated, are now
getting well, and he is able to do for his family.

2. **MARY** his wife, forty-five: I did not see the right foot,
but the woman declared that it was off at the ankle, and both
bones of the leg bare up to the calf. I saw the left foot off
at the ankle, the bones just bare, look well, and there is
much spungy flesh.

CHILDREN, viz.

3. **MARY**, fifteen years old: Catamen. caret; a perfect
sphacelus in both legs up to the knees, which should, in my
opinion, with submission to better judges, be taken off as soon
as possible at the joint, as there is a separation of the live flesh
from the dead there.

4. **ELIZABETH**, thirteen, through extremity of pain stood
a month in the corner of the chimney upon one leg, rubbing
the other, which was drawn up; she neither sat down nor lay
down the whole time: the right foot off at the ankle, the
tibia bare, the left leg off about four inches below the knee,
in a fair way to heal.

5. **SARAH**, eleven: The right foot off at the instep, the
os calcis remaining well; the skin and flesh on the epiphysis
of the tibia just bare, looks well; spungy flesh to about the
middle

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middle of the leg; the left leg no otherwise affected than with a small ulcer on the great toe, which has been very bad: this is the only limb, out of twelve, that may properly be said to be left.

6. ROBERT, seven years old: The right leg off about three inches below the knee, much spongy flesh; the left the bone bare for about half an inch.

7. EDWARD, four: The right foot off at the ankle, much spongy flesh; the bones do not look well. I did not see the left foot, but was told it was much the same.

8. ANN, six weeks: Died suddenly, and afterwards turned black.

IN regard to regimen, I ordered for them, 13 April 1762, as follows; viz.

CLEAN linen was recommended.

FLANNEL shifts and shirts, two of each, in order to change them as oft as needful without danger of catching cold, as they may from using linen only.

THE wounds, I think, should be dressed twice-a day, or at least once—Unguentum euporiston, unguentum basilicon flav. & nig. par. æq. sometimes used with a little opium in it.

THEIR drink a little mild ale, and now-and-then some wine and water, one third to two thirds, acidulated with elix. vitriol. acid. a quarter or half a pint twice a day, according to their ages.

MILK-POTTAGE for breakfast and supper; and for dinner bread-pudding, boiled rice, veal or mutton broth with bread; no salt meat of any kind.

URON

UPON the 13th, I found they had all been too much indulged with old beer, and that a diarrhœa had ensued, which I looked upon in their case to be a dangerous circumstance; and therefore I ordered the following medicine, which, by the way, was not sent till thirty hours after :

℞ Conserv. ros. rub. ʒij. pulv. rhei. elect. è scordio & opio
aa. ʒ ss. pulv. crætæ ppt. ʒ iij. nucis moschat. ʒj. fyr.
è meconio q. f. Fiat elect. cujus capiat pro ratione
virium & ætatis ʒj. ad ʒij. bis vel ter in die, superbi-
bendo cochl. iv. julep è cræta, cujus mitte ℥ij. cui
adde tinct. Theb. gutt. v.

℞ Cort. Peruv. ʒj. coq. in aqua pur. font. ℥ij. ad ℥j.
Colatur; adde rad. serpentar. virg. pulv. ʒij à ʒiij.
elix. vitriol. acid. ad gratum acidum.

THE disorder of this whole family seems to arise from bad living, the consequence of poverty. Their natural excretions are regular, and their minds as calm now as can be supposed in such a wretched situation: their fever is only symptomatic, and such as is for the most part the consequence of inanition.

APRIL 19, 1762, Mary Downing the mother complains of pains about her, numbness in both arms, cannot extend the fingers, and there is a discolouration at the right elbow: an amputation was attempted (contrary to my declared opinion) upon the eldest girl the 17th; and cutting a large vessel just by the articulation of the knee, a large hæmorrhage ensued (they told me a hat-full of blood) and she was thereby rendered very weak. The rest of the children seemed better; their diarrhœa is not yet quite stopped, partly owing to a neglect in using the medicines on account of their taste.

N. B. White wine and water acidulated was given in lieu of red wine.

I ORDERED

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I ORDERED nothing more to be done, as to amputation, without my presence or opinion; and the following cordial to be taken from one to four spoonfuls, according to their ages, when faint :

R Aq. alex. simpl. $\frac{3}{4}$ x. ejusdem sp. $\frac{3}{4}$ v. confect. cardiaci, tinct. croci, aa. $\frac{3}{4}$ fs. syr. alb. $\frac{3}{4}$ x.

APRIL 23d was there, and found the eldest girl's left leg cut off below the bone; she seemed tolerable; but they had all a good deal of the hectic heat, and were very thin: I ordered them the bark decoct. and electuary, and to continue the cretaceous and alexipharmic julep pro re nata, in case of stools, which were not much abated, and in faintness or languors.

N. B. The girl's leg was taken off below the knee (where the sphacelus pointed the separation to be made) Wednesday night the 21st of April, by Mr. Alston alone.

MONDAY, April the 26th, went to see them, found all of them much better, except the eldest girl; she was in great pain with the right leg, the bones of which were not taken off; complained of pains in her head and thigh, and was very feverish, which might proceed partly from the pain, and much more likely from neglect, as neither the acidulated drink, or any of the medicines I ordered for them the 23d instant, were sent in. I left particular orders that all things should be immediately sent in, which his housekeeper assured me should be done as soon as he returned from the labour he was gone to attend. Their pulses were very moderate, their eyes bright, and their countenances, boys ruddy, and girls good.

APRIL the 29th saw them; all better, but yet a good deal feverish: the girl Mary's other leg was taken off at the proper place, and she seemed better, and told me they all could eat well; and would, I believe, have all been much better, had

it

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it not been for neglect of not taking their medicines, which they could not, because they were not prepared ready, and when they had them they disliked them:

MONDAY, May the 3d, saw them all dressed by Mr. Alston; they all seemed more free from fever than they had yet been; I pressed their taking their things regularly, and desired Mr. Alston to keep them properly supplied, as he saw occasion. The stumps of the woman, and the girl with her (though somewhat better) looked a good deal inflamed and angry; and I find there is no dependence on any thing they say, or that passes while we are not ourselves eye-witnesses.

FRIDAY, May the 7th, saw them, and they complained of an aguish disorder; proceeding, I apprehend, from neglect of medicines and a slight re-absorption of the morbid matter, and the great weakness brought on by the attempted amputation.

MONDAY, May the 10th, saw Mr. Bones, who confirmed the above account, and that, as I had said, the man was relapsed, and the eldest girl very bad; but the man very soon got better.

TUESDAY, May the 11th, saw them; the man's fingers worse; Elizabeth pretty well; the boy Bob very feverish; the eldest girl very ill, faint, weak, and low, and the discharge from the stump very great; she would give no answer to any question: the other two girls, the mother, and the youngest boy, better; but the woman complained that when she sat up, the leg that hung down was very painful to her.

THEIR first symptoms, as I was informed (not having seen them till the 7th of April 1762, or indeed heard of them; though they were seized on the 10th of January preceding) were pains in the legs which descended to the toes, which soon turned black, almost instantly, and kept blistering fre-

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quently; and some time after the father happened to cut one of the children's feet, and there issued forth grumous black blood.

Hadleigh, April 7, 1763.

[There is, in the last volume of the Philosophical Transactions, a paper, in which the author endeavours to ascertain the pre-disposing cause of this unhappy affair; but as he accounts for it as we had done in our Museum, vol. I. p. 442, some time before the publication of that paper, we thought it sufficient to refer our readers to that part of our work for satisfaction on this head.]

N^o LXXVIII.

[The Editors of the Medical Museum having been favoured with the following disinterested and judicious Remarks on their Three first Numbers, they think themselves bound in justice to insert them, and to return their thanks to the unknown hand from which they came; and should be glad of the continuation of his notice, agreeable to the obliging hint given.]

AS every mortal is interested in promoting the healing art, it would give me great pleasure to see it arrive at as great perfection as any thing sublunary can; for which reason I use the freedom to send you some of the observations which occurred to me on perusing your three first numbers, which only came to my hand a few days ago, Sept. 1763.

THE author of your first dissertation sets out in a most unphilosophical way:

“Air (says he) by condensation becomes steam, which
“will descend in globules as its parts conglomerate into the
“grosser element called water, which being impressed by fire
“or heat to a certain degree, arises again by rarefaction.”

HAD he said, water by heat becomes steam, which by cold descends in globules, &c. he had said right: but water diffused in air is no more air, than salts diffused in water become water, or than any of the metals diffused or dissolved in a proper liquor become the same with its solvent.

DR. Keil expresses it right; "that watery particles which float in the air, like vapours, are attracted by the skin," &c.

IN a word, air is the universal menstruum (so to speak) which by a proper degree of heat dissolves animals, vegetables, and most part of minerals, but especially mercury and water.

MERCURY is now found to be a real metal, which requires the greatest degree of cold to congeal it, and melts again with the smallest heat; and, if the heat be increased till it boil, evaporates all into the air without leaving one particle.

WATER congeals with a far less degree of cold than quicksilver; but requires a greater degree of heat to melt it; and by a warmth which just keeps it thawed, evaporates all into the air; a greater degree of heat only evaporates it quicker: nay, ice has been found to exhale.

EVERY metal requires a different degree of cold to congeal it, and of heat to melt it; and part of each (except gold and silver) evaporates into air by a proper degree of heat.

ALL salts dissolve in water; yet, when dried, and urged with an intense heat, some of them become fluid; and are again congealed by the cold; others are volatile, and fly off into the air.

BUT neither mercury, water, metals, nor salts, become air: cold precipitates them all to the earth again, and leaves it pure.

I KNOW some people, when they are to ride in cold weather, dip a foot into cold water as soon as they get out of bed, dry it instantly, and put on their boot or shoe; then they dip the other the same way, which they aver keeps them in a comfortable warmth all day, when others are half frozen. This must be owing to the spring given to the fibres, by which the circulation is kept briskly up without allowing the juices to stagnate, which occasions the cold sensation. It would be dangerous in gouty feet.

YOUR articles VIII. and IX. of Number I. give directions to prevent the ill effects of frost, &c.

THE gentleman from Exeter recommends letting the hands and feet remain in the cold water for a minute or two, till they begin to glow with warmth. Would it not do better to dip them in and take them out two or three times, lest even the coldness of the water chill again too much? They do so in Muscovy.

HIS account of the frozen apples is very just; but the philosophic account is not so manifest.

IT is a question, you know, whether there are really frigorific particles, or only a privation of heat and motion; and if there are, how does he know that the cold water attracts these icy particles, and that the hot repels them? Would it not be more rational to say, The cold attracts or extracts these particles softly and fairly? whereas the hot (being destitute of cold) attracts them in such a hurry, that they tear all before them.

LORD Bacon's account (in your notes) is not just; and that snow has a secret heat is a joke.

VAN SWIETEN's account is much better, yet not satisfactory.

BUT there is one phenomenon in freezing, which neither of these gentlemen have taken notice of, and which seems the true cause of a mortification by sudden heat after cold.

WATER gradually condenses as it cools, till it comes to the freezing point; but in the act of congelation it expands with such incredible force that nothing can resist it. Bomb-shells, nay cannons, are split by the forming ice, and part of the water thrust out. When one goes first into the cold air or water all the juices condense, the vessels collapse and look pale, the circulation again pushes the blood into these arteries, whose contracted extremities allow it only to pass slowly, and make them appear red, accompanied with an itching from the obstruction: the blood being still pushed on from behind, whilst the obstruction is increased before, occasions a livid colour and tingling pain; and at last, when the circulation is completely stopped, a gangrenous black finishes the scene, with the loss of all sensation; the vessels being stretched far beyond their natural dimensions by the frozen juices,

Now, by applying cold water these juices are slowly dissolved and condensed into the bulk of the cold water, the vessels have room to contract gradually, which the coldness of the water assists; and by allowing a little space betwixt each dip, all will be thawed, and returned into the circulation with ease; after which, drinking any thin warm liquors will promote a gentle diaphoresis, and all is well,

ON the contrary, when warm water is applied, either the frigorific particles hurry into the water, or the fire (if a real substance) flies into the frozen parts with a great force; either way the vessels are destroyed; for the outside thaws quickly, whilst the inner vessels continue blocked up by what is not melted: hence, no sooner are the juices thawed and condensed a little, but the heat instantly rarefies them again, the vessels are again stretched more than before, which is increased by the warm water relaxing all the fibres till they are effectually destroyed and mortified.

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By dry heat the symptoms vary.

THE vessels are not so evenly relaxed as by water.

HENCE, in mild cases, chilblains, and what are called measles
skins, &c. blisters in a greater conflict betwixt heat and cold
(as in the man descending the Alps, Numb. I. p. 76.) and a
complete gangrene on coming near a fire in excessive cold.

WATER is called by some insipid salt; ice its crystals,
which shoot in a particular manner by the proper degree of
cold: the spiculæ on the frozen apple are only these crystals
formed by the cold of the apple. Water is not the only ar-
ticle which expands on freezing; that mercury does so, ap-
pears from the glasses breaking when freezing, after it had
contracted an incredible length, as the cold increased. (Numb.
II. p. 12.) Melted iron is so dense that cold iron swims on
it as ice does on water.

ARTICLE IV. p. 44. As some people are at a loss to know
which is the Great Water Dock, it will be proper to inform
them that it is the large common Dock, as distinguished from
the sharp-pointed; both grow as weeds through all Britain;
more luxuriant in moist ground, and smaller and more astring-
ent in dry. The sharp-pointed is a succedaneum to the
large; but indeed there is no need of a succedaneum, there is
plenty of both.

DR. Alston, late professor of the materia medica in Edin-
burgh, told his pupils forty years ago, that "there is scarce
"any thing better for scurvy; it goes very far towards a
"cure." May the success answer his expectations!

HE recommended the *Lapathum sanguineum*, or Blood-
wort, as more astringent.

N^o LXXIX.

To the Authors of the MEDICAL MUSEUM.
Of the Appearances of URINE in Diseases attended
with a putrid State of the Blood. By James John-
stone, M. D. of Kidderminster.

IN the malignant feverish disorders which have often fallen under my care in this neighbourhood, from the years 1752 to 1757, I have almost constantly observed that the Urine was turbid, or dropped a copious sediment very early in the disease, without the least amendment in consequence thereof; and that afterwards, when the disease was abating and in its decline, the Urine then became clear without being followed by any relapse.

FINDING it difficult to reconcile these phenomena with the observations of the antients, as they are usually interpreted in the schools, I then began to be persuaded that this turbid appearance in the Urine might indicate a dissolved and putrescent state of the fluids, both in acute and chronic diseases. I reasoned thus:

“ IN continual fevers of the inflammatory class a crisis is most probably brought about by a resolution of the too dense particles of our fluids analogous to that, which, carried to excess, causes often malignant, putrid, petechial fevers: of this salutary resolution of the morbid matter in inflammatory diseases (or such as are attended with a dense state of the fluids) a sediment in the Urine is an effect and sign.

“ IN putrid fevers the blood is still more melted down, and the putrid matter being more copiously mixed in the Urine, gives it that turbid appearance, sometimes with and sometimes without a sediment; which appears generally in the very beginning

beginning of such fevers, giving a very dubious omen of their event: but a turbid Urine shews a greater degree of dissolution in the humours than a mere sediment, which must be denser than those particles which remain mixed in the Urine. A clear yellow Urine, at or after the height of these fevers, is rather a salutary and promising appearance in them, shewing the contexture of the blood is as much inspissated as the health of the individual requires, and that the dissolved and corrupted parts of the fluids, or the morbid matter of these fevers, in other words, is thrown off or altered *.

THE observations which I have made since in all the different species of putrid diseases perfectly confirming and agreeing with the above, have made me no longer doubt, but that a turbid, thick, or settling Urine is as much a characteristic of a putrid tendency and disposition in the fluids, is as invariably connected with such a condition of the blood, as a limpid Urine is with spasms; and that without a fever such a foul, turbid Urine is, as very celebrated writers have affirmed, a diagnostic sign of the scurvy; and that with a fever, especially in its increment, or without remission, it shews the fever to belong to the putrid class, in which the texture of the blood is running into putrescence and dissolution, from some general apt cause, or topical fomes.

GENERALLY speaking then, whatever the disease be which is attended with a very foul, turbid Urine, the disease still subsisting in its vigour, it may be presumed to arise from a dissolved, putrid crasis of the blood, and we may conclude it to be one proper sign of putrid and malignant fevers.

IN this class of fevers such an index of the blood's state is more particularly useful and deserving of attention, as venæ-

* See an Historical Dissertation concerning the malignant Fever of 1756, &c. at Kidderminster, by James Johnstone, M. D. p. 30.

section is for the most part, in such circumstances, a dangerous practice.

If the relation of a thick Urine to a corrupted blood needed any other proof than faithful observations made in diseases, this might be drawn almost to demonstration from easy experiments upon the Urine itself; for the clear Urine of the most healthful person standing in a room moderately warm about the fifth day smells highly putrid, and at the same time is become turbid, with a scum on the surface and a sediment at the bottom of the glass: it resembles the Urine of persons labouring under putrid fevers and a scorbutic habit; and this imitation may be rendered more exact by mixing at first a little pus with the recent Urine.

THE same truth might be supported by facts related in the works of Dr. Huxham, as well as in those of more ancient observers of the best credit; but I shall, instead of a great variety much to our purpose, now only quote a paragraph in the seventh part of the *Ratio Medendi* of the justly celebrated De Haen; a more extraordinary case is hardly to be met with:

“A YOUNG man, twenty-four years old, on the 12th of December 1761, had the trunk of the femoral artery intercepted by ligature for an aneurism; with much care he recovered the warmth and perfect use of the limb: the patient was for three or four months threatened with frequent returns of gangrene, for which the bark was liberally used, both internally and externally; it was used internally till the month of August following.” De Haen took notes of the various appearances of the Urine in the whole course of his attendance upon this patient, and that more than once every day. “The day before the operation was performed the Urine was thick, and continued in that condition for ten days after; from the time he used the bark the Urine was less turbid and sooner settled, but was unusually high coloured.

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“ JANUARY 2d and 3d, things going on well, the Urine had a natural appearance; but on the four subsequent days degenerated into the former state. From January 8th the Urine was redder with a thick whitish sediment, which soon subsided, with a furfuraceous appearance near the surface, and this was covered with a pinguious pellicle, which in different lights appeared yellow, redish, purple, and green: while the Urine was in this state, the quantity of the pus was great for the compass of the wound; and that which came from its more sinous recesses was fetid.

“ JANUARY 14th and 15th, the pus voided was little in quantity and hardly fetid; the urine also had scarce any sediment, scarce any pellicle, scarce any colour but what is natural; when the gangrene afterwards appeared with feverish shiverings, the Urine again was thick, turbid, and covered with a scum as before; and after it had stood longer dropped a thick sediment: when the gangrene was stopped, the Urine was turbid indeed, but presently settled, with very little scum, and at length almost became natural.

“ FEBRUARY 28th, a feverish horror ushered in a great gangrene, the Urine became again thick, turbid, furfuraceous, and covered with a scum as before: while we were long ineffectually struggling with this gangrene, by increasing greatly the doses of the cortex, we were surprized to find the Urine appear natural for three weeks together, excepting only twice. Natural, I call the Urine, because it only differed from the natural by the addition of a thickish suspension or nebula, with a little farina in it.

“ THE cause of this digression is, if possible, to illustrate the intricate doctrine of Urines: but how obscure, how abstruse, how inexplicable is it! The Urines observed some kind of explicable order to the end of the last gangrene, none after; by the help of the cortex in the early gangrenes, they changed

"JANUARY 2d and 3d, things going on well, the Urine had a natural appearance; but on the four subsequent days degenerated into the former state. From January 8th the Urine was redder with a thick whitish sediment, which soon subsided, with a turbid appearance near the surface, and this was covered with a pinguious pellicle, which in different lights appeared yellow, redish, purple, and green: while the Urine was in this state, the quantity of the pus was great for the compass of the wound; and that which came from its more inner recesses was found

"JANUARY 14th and 15th, the pus voided was little in quantity and hardly felt; the urine also had lost any sediment, lost any pellicle, lost any colour but what is natural: when the gangrene advanced, appeared with feverish shiverings, the Urine again was thick, turbid, and covered with a foam as before; and when it had again dropped a thick sediment, when the gangrene was stopped, the Urine was turbid, but not so much as before, with very little foam, and at length almost became natural.

"FEBRUARY 2d, a second horse entered in a great gangrene, the Urine became again thick, turbid, turbidaceous, and covered with a foam as before: when it was long fast, testually fighting with the gangrene, by fighting greatly the holes of the cortex, we were surprised to find the Urine appear natural for three weeks together, excepting only twice. Natural, I call the Urine, because it only differed from the natural by the addition of a whitish suspension or nebula, with a little foam as it

"The cause of this disposition is, if possible, to illustrate the intricate doctrine of Urine; but how obscure, how abstruse, how inexplicable is it! The Urine observed some kind of explicable order to the end of the last gangrene, none at all: by the help of the cortex in the early gangrenes, they changed

arranged for the better; after the last gargle, though the
 medicine will continue in the same dose, the *Urtica*
 is variously used. It is used to clear the
 and charged; in fevers such appearances denote obstinate
 with a beginning, vain effort to produce action;
 but here they denote the same and phacelus: such a phal-
 le as here appears, and to produce fever and calculus
 out in the case it is a marked morbid condition.

It is found in the same phenomena in the Urine,
 which is found in the same phenomena in the Urine,
 arise from the same cause, and are
 signs of it, and in a certain measure
 the common cause and point of view of various
 kinds, and in a certain measure
 the principal thing in the Urine,
 in such cases, and in a certain measure
 doctrine in the Urine,
 Kidney.

Extract of the Urine,
 Of the Urine, and of the Urine,
 of the Urine, and of the Urine,
 four and weight.

GOLD in its pure state is reckoned too soft and flexible
 for use, and is therefore hardened, and rendered it better adapted
 for use, it is allowed to be mixed with a certain quantity
 of silver.

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Medical Museum

Blue Helmet flower or Monkshood.

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changed for the better ; after the last gangrene, though the bark was still continued in the same dose, the Urine was surprisingly various. But whence were the Urines so often turbid and charged ? In fevers such appearances denote obstinate crudity, with a beginning, but vain effort to produce coction ; but here they denote a gangrene and sphacelus : such a pelli- cle as here appeared is said to presage scurvy and calculus, but in this case it always attended mortification.”

IF it should appear that these phænomena in the Urine, which so much perplexed this learned, this ingenious author, arise from some degree of putrefaction in the blood, and are signs of it, and that this putrescence is in a certain measure the common cause of scurvies and putrid fevers of various kinds, and in a higher degree of gangrenes, we apprehend the principal difficulties attending the explanation of Urines in such cases will vanish, as well as many others attending the doctrine of crudity and coction in general.

Kidderminster, Oct. 16, 1763.

N° LXXX.

Extract from Dr. Lewis's *Commercium Philosophico-Technicum*.

Of the Alloy of Gold, and the Methods of judging of the Quantity of Alloy it contains from the Colour and Weight.

I. Of the Alloy of Gold.

GOLD, in its pure state, is reckoned too soft and flexible for the common purposes of coins and utensils ; and hence, to increase its hardness, and render it better adapted to these uses, it is allowed to be mixed with a certain quantity

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of inferior metals, which, in respect to the Gold, are called Alloy, and whose proportion is settled by law; that these admixtures are of so much advantage in regard to the use of the metal, as has been commonly thought, may perhaps be questioned; for though fine Gold may be scratched or bent easier than such as is alloyed, yet, as is observed in a judicious essay on Money and Coins, published in 1758, the alloyed appears to be diminished more by wearing than the fine.

THERE are cases in which an admixture of Alloy appears absolutely necessary, as particularly in Gold plates, for being enamelled, if the plates are made of fine Gold, they bend, and change their figure in the heat requisite for making the enamel melt: the workmen find that the quantity of Alloy permitted in coins prevents this inconvenience, and that a greater quantity cannot be employed, as it would occasion the Gold to melt.

FROM the account given in the fifth section of the effects of different metals upon Gold it appears, that silver and copper are the only ones fit for serving as its Alloy; all the others debasing its beauty, and greatly injuring or destroying its malleability; happily also these are the two metals which are ofteneft naturally blended with it in the mines; so that the trouble and expence of refining it are thus greatly lessened, as the natural Alloy is frequently in a smaller proportion than the standard quantity, as well as in a greater; it is plain that Gold below the standard fineness may frequently be brought to the standard without any refining at all by melting it with a due proportion of such as is above the standard. In this view, the admitting of Alloy for all those intentions in which it is not injurious, is of manifest advantage.

THE degree of fineness of Gold, or the proportion of Alloy it contains, is accounted by imaginary weights called carats; the whole mass is conceived to be divided into twenty-four carats, and so many twenty-fourth parts as it contains of pure

pure Gold, it is called Gold of so many carats, or so many carats fine; thus Gold of eighteen carats is a mixture of which eighteen parts in twenty-four are pure Gold, and the other six parts an inferior metal; and in like manner Gold of twenty carats contains twenty parts of pure Gold to four of Alloy: this is the common way of reckoning in Europe and at the Gold mines in the Spanish West Indies, but with some variation in the subdivision of the carat; amongst us it is divided into four grains; among the Germans, as appears from the treatises of Ercker, Cramer, and other German assayers, into twelve parts; and by the French, according to Mr. Hellot's, into thirty-two: the Chinese reckon by a different division, called touches, of which the highest number, or that which denotes pure Gold, is one hundred; so that a hundred touches correspond to our twenty-four carats, seventy-five touches to eighteen carats, fifty touches to twelve carats, and twenty-five to six; from whence any number of the one division may be easily reduced to the other.

THE standard Gold of this kingdom is of twenty-two carats; that is, it consists of twenty-two parts of fine Gold and two of Alloy; the Alloy is more commonly a mixture of silver and copper, than either of them alone; silver alone, in so considerable a quantity, giving too great a paleness to the Gold, and copper alone too great a redness, it is difficult for the assayers, as we shall see hereafter, to determine with minute exactness, the fineness of a given mass of Gold; and it is not to be expected that the workmen, in every piece intended for standard Gold, should be able to attain to the exact standard proportion of Alloy in the English coinage, which all possible precautions are taken to keep as near as may be to the standard. A certain latitude is allowed in this respect, called the remedy for the master of the mint; out of every fifteen pounds of Gold coined at the mint (according to the account published by the learned Mr. Folkes, late president of the Royal Society, in his curious tables of English silver

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silver coins) some pieces are taken at random, and deposited in a strong box called the *pix*; at certain intervals, sometimes of one year, and sometimes of several years, the *pix* is opened at Westminster in the presence of the lord chancellor, the lords commissioners of the treasury, and others, portions taken from the pieces of each coinage are melted together, and an assay made of the collective mass by a jury of the goldsmiths company: at this trial the mint-master is held excusable, though the moneys be either too base or too light, provided the imperfections and deficiency together are less than the sixth part of a carat, which amounts to forty grains of fine Gold on the pound of standard, or the one-hundred-and-thirty-second part of the value. It is said that this remedy is contained within as narrow limits as any workers can reasonably be supposed to make themselves answerable for.

THE proportion of Alloy in other nations is various: according to the assays of sundry foreign coins made at the Tower by the direction of Sir Isaac Newton, and published in Arbuthnot's Tables of Coins; the *moidores* of Portugal and their subdivisions, and the old *pistoles* and *doublons* of Spain and Italy, are a little worse than our standard, but within the latitude allowed to our own mint-master; the new *louis d'or* of France is about a fifth of a carat below that latitude; the *ducats* of Germany, Holland, Sweden, and Denmark, are a carat and a half better than standard; and the *sequin* of Venice the finest of all the modern European coins, is a carat and seven eighths better, or only an eighth of a carat worse than fine Gold.

THE standard Gold of England was formerly of the same fineness with the Venetian *sequin*; to wit, twenty-three carats three grains and a half; our present standard of twenty-two carats was introduced in 1527 (about two hundred and seventy years after the commencement of our Gold coinage) for a particular sort of coin called crowns, of equal value with those of

the same name, which have since been formed of silver; and hence this kind of Gold has been frequently distinguished by the name of crown Gold. Both the old and the new standards were continued to 1642, since which period only the latter has been used; the remedy for the master of the mint has been almost always an eighth part of a carat for the old standard, and a sixth of a carat for the new.

A POUND of standard Gold in the English coinage is cut into forty-four guineas and a half; so that the mint price of fine Gold is four pounds four shillings and eleven pence half-penny an ounce nearly; lower than this the price of Gold bullion cannot fall, the mint being always ready to exchange it on that footing for coin; but there are sundry causes which may render it higher, and which it does not belong to the present purpose to examine: the reader may consult on this subject the essay on Money and Coins already quoted, where he will meet with abundant satisfaction.

A POUND of standard silver, containing eleven ounces two penny-weights of fine silver, is cut into sixty-two shillings; whence the proportional value of fine Gold to fine silver is, in our coinage, as fifteen and one fifth to one. Sir Isaac Newton observes, in a representation to the lords of the treasury in the year 1717, that in the mints of Spain and Portugal the value of Gold is sixteen times that of silver; but that in those countries payments in silver bearing generally a premium of 6 per cent. the proportion may be looked upon as fixed by commerce at fifteen and one twenty-fifth to one; that in the other parts of Europe the value of Gold is at most fifteen; and in China and Japan but nine or ten times that of silver; so that Gold is rated higher in England than in any other part of Europe, and higher in Europe than in the Eastern countries. Hence, in a great measure, arise the profits of exchanging Gold for silver in one place, and re-exchanging them in another; and hence the greater disparity between the relative quantities

quantities of Gold and silver in one commercial nation than in another, that metal being brought in most abundance which is rated highest in proportion to the other, and that which is rated lowest being drained away.

THE Alloy of Gold, though it consists of silver, and though its quantity be greater than that of the standard proportion, down to certain limits, is reckoned of no value; the value of the mass is estimated only from the quantity of fine Gold it contains, and from this, for every carat that it is below the standard fineness, there is commonly a deduction made of four pence an ounce for the charges of refining. A certain quantity of Gold mixed with silver loses also its own value, and is reckoned only as a part of the silver; there can be no fixed limits for the proportions in which the value of one metal is thus absorbed by the other, as they must depend on the expence of separating the two metals in different places, by the operation there commonly practised. The author of the essay on Money and Coins above quoted says, he has been informed that a penny-weight of Gold in a pound of silver, or one part in two-hundred-and-eighty-eight, is reckoned among us the least proportion of Gold that will pay for refining, and that in this there is a profit only of about one farthing on the ounce.

II. Method of judging of the Fineness of Gold from its Colour.

THOSE who are accustomed to the inspection of Gold variously alloyed, can judge nearly, from the colour of any given mass, the proportion of Alloy it contains, provided the species of Alloy is known: different compositions of Gold with different proportions of the metals which it is commonly alloyed with, are formed into oblong pieces, called needles, and kept in readiness for assisting in this examination, as standards of comparison.

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THE proportions in the composition of the several needles are adjusted, in a regular series, according to the carat weights, as explained in the preceding article; the first needle consists of fine Gold, or of twenty-four carats; the second of twenty-three carats and a half of fine Gold, and half a carat of Alloy; the third of twenty-three carats of fine Gold to one carat of Alloy; and so on, the Gold diminishing and the Alloy increasing by half a carat in each needle, down to the twentieth carat; all below this are made at differences of whole carats, half a carat being scarcely distinguishable by the colour of the mass when the proportion of Alloy is so considerable. Some make the needles no lower than to twelve carats; that is, a mixture of equal parts of Gold and Alloy; others go as low as one carat, or one part of Gold to twenty-three of Alloy.

FOUR sets of these needles are commonly directed; one, in which pure silver is used for the Alloy; another, with a mixture of two parts of silver and one of copper; the third, with a mixture of two parts of copper to one of silver; and the fourth, with equal parts of the two: to which some add a fifth set with copper only; an Alloy which sometimes occurs, though much more rarely than the others. If needles so low as three or four carats can be of any use, it should seem to be only in the first set; for in the others, the proportion of copper being large, the differences in colour of different sorts of copper itself will be as great as those which result from very considerable differences in the quantity of Gold. When the copper is nearly equal in quantity to the Gold, very little can be judged from the colour of the mass.

IN melting these compositions the utmost care must be taken that no loss may happen to any of the ingredients, so as to alter the proportions of the mixtures; the crucibles should be of the smoothest kind, that no particle of the metal may lodge about the sides; the copper should be taken in one round lump, that its surface being as small as possible, it

may be the less disposed to be scorified; that this may be the more effectually guarded against, some inflammable matter, as pitch, resin, or a little charcoal in fine powder, should be added to the borax used as a flux, and the fusion should be expeditiously performed, so as that the copper may be no longer exposed to the fire than is absolutely necessary for its due union with the others; the flux being previously melted in the crucible, and brought to a strong heat, such as is sufficient for the melting of copper: the metals are to be dropped in as soon as they appear perfectly fluid; the crucible, after being gently jogged or shaken to promote the collection and settling of the metal, is to be taken out of the fire, and set on some warm support, that the mixture may not cool too hastily. The fusion may be commodiously performed also, the quantity of the metals employed for this use being commonly small, by placing them in a cavity made in a piece of charcoal, and directing upon them, by a blow-pipe, the flame of a lamp; those who are accustomed to the use of the blow-pipe will find this method rather more secure than that by the crucible, as well as more convenient and expeditious. In whatever manner the process is performed, the several masses must be weighed after the fusion, and if the least diminution has happened in any, fresh mixtures must be prepared in their room.

THE colours are best examined by means of strokes drawn with the metals on a particular kind of stone, brought chiefly from Germany, and called from this use a touch-stone; the best sort of which is of a deep black colour, moderately hard, and of a smooth, but not polished surface; if it is too smooth soft Gold will not easily leave a mark upon it; and if rough, the mark proves imperfect upon it: if very hard, the frequent cleaning it from the marks, by rubbing it with tripoli, or a piece of charcoal wetted with water, gives the surface too great a smoothness; and if very soft, it is liable to be scratched in the cleaning; in want of the proper kind of stone, moderately smooth pieces of flint are the best substitutes;

tutes; the more these approach in colour to the other, the better.

THE piece of Gold to be examined being well cleaned in some convenient part of its surface, a stroke is to be made with it on the stone, and another close by it, with such of the touch needles as appears to come the nearest to it in colour; if the colour of both upon the stone is exactly the same, it is judged that the given mass is of the same fineness with the needle; if different, another and another needle must be tried, till such a one is found as exactly corresponds to it: to do this readily practice only can teach.

IN making the strokes, both the given piece and the needle of comparison are to be rubbed several times backwards and forwards upon the stone, that the marks may be strong and full, not less than a quarter of an inch long and about a tenth or an eighth of an inch broad; both marks are to be wetted before the examination of them, their colours being thus rendered more distinct: a stroke which has been drawn some days is never to be compared with a fresh one, as the colour may have suffered an alteration from the air; the fine atoms left upon the touchstone being much more susceptible of such alteration than the metal in the mass. If the piece is supposed to be superficially heightened by art in its colour, that part of it which the stroke is designed to be made with should be previously rubbed on another part of the stone, or rather on a rougher kind of a stone than the common touchstones, that a fresh surface of the metal may be exposed. If it is suspected to be gilt with a thick coat of metal finer than the internal part, it should be raised with a graver to some depth, that the exterior coat may be broken through; cutting the piece in two is a less certain way of discovering this abuse, the outer coat being frequently drawn along by the shears or chissel, so as to cover the divided parts.

THE metallic compositions made to resemble gold in colour are readily known by means of a drop or two of aqua fortis, which has no effect upon Gold, but dissolves or discharges the marks made by all its known imitations; that the touchstone may be able to support this trial, it becomes a necessary character of it not to be corrosible by acids; a character which shews it to be essentially different from the marbles, whereof it is by many writers reckoned a species. If Gold is debased by an admixture of any considerable quantity of these compositions, aqua fortis will in this case also discharge so much of the mark as was made by the base metal, and leave only that of the Gold, which will now appear discontinued, or in specks: silver and copper are in like manner eaten out from Gold on the touchstone; and hence some judgment may thus be formed of the fineness of the metal from the proportion of the remaining Gold to the vacuities.

ERCKER observes, that hard Gold appears on the touchstone less fine than it really is; it may be presumed that this difference does not proceed from the simple hardness, but from the hardness being occasioned by an admixture of such metallic bodies as debase the colour in a greater degree than any equal quantity of the common Alloy: silver and copper are the only metals usually found mixed with Gold, whether in bullion or in coins, and the only ones whose quantity is attempted to be judged of by this method of trial.

THE Chinese are said to be extremely expert in the use of the touchstone, so as to distinguish by it so small a difference in the fineness as half a touch, or a two-hundredth part of the mixture. The touchstone, as I am informed, is the only test by which they regulate the sale of their Gold to the European merchants; and in those countries it is subject to fewer difficulties than among us, on account of the uniformity of the Alloy, which is there almost always silver; the least appearance of copper being used in the Alloy gives suspicion of fraud:

fraud: as an assay of the Gold is rarely permitted in that commerce, it behoves the European trader to be well practised in this way of examination, by carefully attending to the above directions, and by accustoming himself to compare the colours of a good set of touch needles; it is presumed he will be able to avoid being imposed on, either in the touch itself, or by the abuses said to be sometimes committed of covering the bar or ingot with a thick coat of finer metal than the interior part, or of including masses of base metal within it. A set of needles may be prepared for this use with silver Alloy, in the series of the Chinese touches, or the needle of the European account may be easily accommodated to the Chinese by means of a table formed for that purpose on the principles already explained. It may be observed that the Gold shoes of China have a depression in the middle, from the shrinking of the metal in its cooling, with a number of circular rings, like those on the balls of the fingers, but larger. I have been told that when any other metallic mass is included within, the fraud is discoverable at sight, by the middle being elevated instead of depressed, and the sides being uneven and knobby; but that the same kind of fraud is sometimes practised in the Gold bars, where it is not discoverable by any external mark.

III. Of estimating the Fineness of Gold from its Gravity.

THE greatest excess of the weight of Gold above that of the metal used for its Alloy, affords another method of judging of the quantity of Alloy or debasement in any given mixture, where the species of Alloy is known.

It may here be proper to caution the reader against an error which has sometimes been fallen into in computing the specific gravities of mixts from those of their ingredients; if the gravity of one metal was nine, and that of another eighteen, it has been inadvertently reckoned that the gravity of a mixture
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of equal parts of the two would be the medium between nine and eighteen, or thirteen and a half; if by equal parts were meant equal bulks, this would indeed be the case; but when the parts are taken by weight, as they are always understood to be in mixtures of this kind, it is otherwise, for eighteen weights of the one metal on being immersed in water will lose two, and eighteen of the other will lose one; so that thirty-six of the mixt will lose three; whence the specific gravity, which is found by dividing the weight in air by the loss in water, instead of being thirteen and a half, turns out but twelve.

FINE Gold, as we have seen before, loses in water one grain in every nineteen and three tenths nearly; whereas fine silver loses one grain in about eleven; from whence it is easy to find the loss of any number of grains of each, and consequently of any assignable mixture of the two metals: thus, fifty grains of Gold will lose above two and a half, and fifty grains of silver somewhat more than four and a half; so that a mixture of equal parts of the two will lose above seven in a hundred, or one in fourteen; in like manner a mixture of Gold with half its weight of silver will be found to lose one part in fifteen and four tenths; with a third of silver, one in sixteen and two tenths; with a fourth, one in fifteen and seven tenths; and with an eleventh of silver, which is the standard proportion of Alloy, one in eighteen and one tenth. On this principle the specific gravity or proportional loss in water of Gold alloyed with different quantities of silver, copper, and mixtures of both, may be computed and formed into tables for abridging the trouble of calculation in the trial of given masses.

A PERSON said to have made large profits in the purchase of Gold from the Chinese, made use of this method for estimating the fineness of the Gold; with the assistance of tables now in my hands, he could readily determine, by the balance,
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the quality of the whole compound, or the quantity of fine Gold it contained, without any danger of being imposed on by a superficial coat, however thick, or by any baser materials that were there known being included within the mass; the Chinese Alloy being, as already observed, almost always silver, contributed not a little both to the facility and accuracy of the examination.

THE above method of calculation supposes, that when the two metals are melted together, each of them still retains its own proper gravity, as if they were joined only by simple apposition. In mixtures of Gold with silver this appears to be the case; but in mixtures of it with other metals there are some variations: Gold and copper melted together prove specifically lighter, or lose a greater proportion of their weight in water than if they were weighed separately. Mr. Gellert, in a treatise of Metallurgic Chemistry, published in 1750, observes, that the same thing happens in mixtures of Gold with zinc, tin, and iron; but the reverse in mixtures of it with lead and bismuth: in some of the compositions of Gold with platina, a dilatation of the volume, whence necessarily results a diminution of the specific gravity, or of the weight under an equal volume, is apparent to the eye, the mixture in its return from a fluid to a solid state, instead of shrinking and becoming concave, expanding and becoming convex. Platina purified by solution in aqua regis, and precipitation with quicksilver, being melted with twice its weight of fine Gold, and the fusion repeated upwards of twelve times successively, the surface of the mass, when cold, was every time convex, the Gold being gradually increased, the convexity continued sensible, till the quantity of Gold was upwards of ten times greater than that of the platina; but when the Gold was in very large proportion, the mixture shrunk, and became concave like pure Gold.

FROM these dilatations and contractions of volume which happen in different mixtures, it may be presumed that the hydro-

hydrostatic balance cannot discover with certainty the exact fineness of Gold, unless when silver is the metal mixed with it; when the Alloy is copper, some allowance must be made, not only for the diminution of gravity arising from mixture, but likewise for the differences in the gravity of copper itself, that of some sorts, being about nine, and that of others, though seemingly of equal fineness, scarce eight and three fourths: when Gold is alloyed with both copper and silver, though the foregoing causes had no influence, the quantity of Gold could not be found to any exactness, unless the proportions of copper and silver to one another were known.

N^o LXXXI.

The Case of a Man whose Heart was found enlarged to a very uncommon Size. By Mr. Rich. Pultney.

THOMAS C——, aged about thirty-two or thirty-three years, had the rickets in his infancy, and continued very weakly for several years. In the winter of the year 1759, upon taking cold, he was afflicted with peripneumonic and pleuretic symptoms, which had scarcely left him, when he was seized in the summer of the year 1760 with a fever and very violent rheumatism; this, after affecting most of his joints, remained, and was most troublesome in his knees: when he was somewhat better of his rheumatism, but before the pain and stiffness of his joints had left him, he was advised to go into the cold bath; he did so; but upon coming out again instantly felt such an increased load, fainting, and anxiety about the præcordia, that he thought he should scarcely have recovered the shock it gave him; nevertheless he ventured in again a day or two afterwards, and experienced the former symptoms in an aggravated degree, and from this time dated the disorder which terminated his life. A palpitation of the heart, to which he had been subject for some years before, became
now

now much stronger, and gradually increased with his other complaints to a very great degree. His rheumatism continued to affect his breast and all his joints, particularly his knees; especially upon taking cold, or any little irregularity in the non-naturals, he became weaker, breathed shorter, especially upon walking a little, or talking rather more or higher than usual; any of which exertions put him out of breath presently.

WHEN he first applied to me in the beginning of March 1761, I found him labouring under the above-mentioned complaints, and upon examining his pulse found it soft and extremely quick; it commonly went at the rate of one hundred and ten in the morning, and in the evening one hundred and twenty pulsations in a minute, as I repeatedly observed. The palpitation of the heart struck me instantly, as it shook his whole body at every stroke: I could never observe any inequality of the intermittent kind in the pulse under any the most accelerated motion thereof, or in whatever situation the body was placed.

AT this time the chylopoietic organs were all tolerably good; stimulating food, or fermented liquors, had for some time always increased his anxiety and load upon his breast, and this experience had induced him to refrain from them.

HE had slept very ill for several months, sometimes not more than an hour or two during the whole course of the night: he could not sleep on the left side at all, and was always easiest in an erect posture. He was commonly waked with a sense of suffocation, from the vast load and oppression upon his breast, and from the strength of the palpitation.

FROM his first appearance to me I had no hopes of doing him any real service, as I thought it evident from his complaints, and particularly from the great and uninterrupted palpitation and the feel of the pulse, that there was something very extraordinarily disordered in the Heart itself, or in some

of the large vessels near it: the regularity of the pulse inclined me to suppose an aneurism, rather than polypose affections. All this time, however, no outward appearance strengthened this supposition: no remedies alleviated his complaints, except bleeding, which gave a relief, but very temporary, and weakened him too much to be repeated more than once; all that it seemed to do for him was, the procuring him rather more sleep the night after than he usually had, and easing a little tickling cough which had remained with him ever since the year 1759 at times, and particularly since his rheumatism, but which was never very troublesome.

Soon after I first saw him his legs became oedematous, and by the beginning of April his thighs were much enlarged, and at length his belly in some degree; at this time he began to cough more from having taken cold, inadvertently as he thought; but he soon expectorated freely. By the middle of April he was too weak to sit up, nor could he speak or stir without being ready to expire for want of breath. On the night of the 20th of April, as he was coughing, an hemoptoe suffocated him instantly.

ABOUT two quarts of a thin coffee-coloured liquor were found in the cavity of the abdomen; the omentum was very small, perhaps it would not weigh more than two ounces; the stomach and intestines were greatly inflated; in all other respects the viscera of this cavity, as far as an hasty examination would permit us to observe, were in a sound state.

In the thorax we found the lungs very sound, but extremely turgid with blood; they adhered very firmly to the pleura on both sides, and particularly on the left, where the adhesion was almost total: the Heart, as might be expected, appeared to be the organ principally affected; the pericardium adhered almost every where so close as to form, as it were, the external coat thereof. The Heart itself was of an enormous size, of a very pale colour, and loose and flaccid in its texture,

texture, to a very remarkable degree: as far as I could judge from the most careful examination and comparison, I could not find that either of the auricles or ventricles bore an extraordinary proportion to the other. The whole Heart might be said to be intirely aneurismatical; the parietes were every where thin in proportion to the size of the whole; there was no particular enlargement of the aorta, as far as I traced it, which I did to some distance; but its texture, as that of the Heart, was very lax and flabby: I could not find the least polypose concretions in any part whatsoever. When the Heart was cut short from the great vessels, emptied of the coagula, and washed as clean as possible, it weighed upwards of twenty-eight ounces avoirdupoise weight.

OBSERVATIONS.

THE size of the human Heart in a natural state is known to differ greatly in different subjects: dissections prove this beyond all controversy; and it is usually supposed that the capacity of the blood-vessels bears a general proportion to the size of the Heart itself *. Very few anatomists in describing this organ have estimated its size by its weight; Dr. Haller †, where he treats so amply and professedly upon the Heart, does not from his own knowledge mention its weight; from Tabor, he says, it is estimated at ten ounces; but this is supposed to be when freed from the auricles as well as the extremities of the larger vessels. Its mean weight by some other anatomists is reckoned at thirteen ounces.

OF Aneurisms of the Heart, both with and without polipose concretions, many instances occur in writers of observations: Dr. Douglas ‡ saw a young man who died of a palpitation of

* Hoffman. Opera omnia, tom. i. lib. i. cap. 6. de Sanguine Circuitu. Suppl. II. par. iii. p. 62. Histor. Corp. human. Anatom. sect. 641.

† Elem. Physiolog. vol. i. p. 326.

‡ Phil. Trans. abridged by Jones, vol. v. p. 229.

the Heart, the left ventricle of which was found three times larger than the right: this case bears a considerable analogy to the instance before us, and is quoted, among several others, by the Baron Van Swieten, in treating upon aneurisms of the Heart *. The Baron also relates a case from Lancisi, in which the left ventricle was twice as large as the right, and the whole Heart weighed two pounds and a half. Hoffman in his *Systema*, when treating upon the palpitation of the Heart, gives us a case where the Heart was greatly distended, but does not ascertain to what degree by any method whatsoever; he only says, “*Cor miræ fuit magnitudinis †.*”

DE HAEN, in his *Ratio Medendi ‡*, tells us he was present at the opening of a man whose Heart was three times bigger at least than in its natural state; the dilatation was in its left ventricle, which was so thin as to resemble a whitish membrane only, and the Heart was broader at its apex than at its base.

DE HAEN likewise in his *Ratio Medendi ||* informs us, that the Heart of a woman who died of a fever, with extreme debility, weighed twenty-four ounces, even after it was washed and wiped very dry; this increased magnitude arose more particularly from the left ventricle; the extension of ventricles was so great, that they both together contained more than a quart. Though this woman was no more than thirty-seven years of age, the aorta at its base was degenerated into bone, and was four inches in circumference: besides the whole portion of the aorta at its base being ossified, there were interspersed, in several parts of its length, what our author calls *insulæ ossæ*. In one who lived so long as the excellent Wepfer, such appearances are not extraordinary; but

* Comment. in Aphor. vol. v. sect. 176.

† Opera omnia, tom. iii. p. 92.

‡ Cap. xxx. de Aneurysmate,

|| Pars sexta, p. 143.

in one so little advanced as the woman in question, these ossifications are very unusual.

It would be endless to quote instances of the preternatural dilatation of this organ; to name no more, we have a very recent and striking one of this kind * in the body of our late most gracious sovereign, whose sudden death was owing to the rupture of the right ventricle of the Heart; a circumstance which cannot be conceived to have taken place without a previous gradual dilatation of the same, and that probably to a very considerable degree.

IN cases of this kind commonly one of the ventricles is found distended to a monstrous size, while the rest of the Heart remains nearly in its natural state: it is but rare, perhaps, that the Heart is seen so equally and universally enlarged as in the case under consideration.

THIS man, I have observed, had the rickets when a child; in this disorder the whole system is found to be in a very lax, debilitated state, and the Heart is said to be so in particular. The constitutions of ricketty children frequently amend as they grow up, and particularly about the age of puberty; but in this case, I think we may safely conclude that this man's Heart never recovered its due tone after he grew up; it is scarcely to be supposed that the Heart could suffer so great an enlargement during the last year or two of his life only; the more so, as I remember to have heard him say, that for many years before his death a very little exercise put him out of breath: doubtless it was increased greatly toward the latter part of his life by his business, which obliged him to exercise much, particularly in walking; so that before he got his rheumatism, he came home so weak and so much fatigued with his usual day's exercise, that he has been almost unable

* A full account of this will be given in a future number of this work from his majesty's physician, with a fine plate of the same.

to stir for a day or two. We may add to this, the increased force the Heart sustained during the time that he laboured under his inflammatory disorders, both before and after his rheumatism seized him.

THE great increase of his disorder upon going into the cold bath is not surprising; the shock of the cold water and the resistance necessarily given by that means to the circulation, must occasion a vast surcharge of blood in the auricles and ventricles of the Heart, already too weak to perform its office with sufficient power. Besides the impropriety of such a step, while there was reason to think that the inflammatory spissitude of the blood was by no means overcome, the preternatural distension was doubtless increased thereby.

FROM hence, however, may be deduced an useful hint in practice; namely, where from the state of the pulse, from a palpitation of the Heart, a faint, weak voice, an aptitude to fall into lipothymies from slight causes, or from the concurrence of any other symptoms, we have reason to suspect that the Heart is too weak; in such cases not to direct cold bathing, until such time as the patient has been prepared for it, by going into water between the degrees of tepid and quite cold water; nay, probably it might be better to wait, before cold bathing be prescribed at all, till the effect of medicines seems previously to have invigorated in some degree the cardiac system.

THE considering the Heart as a muscle capable, like all others, of great alteration respecting its tone, and at the same time that such alteration must affect the whole animal economy, from the very great importance of the organ itself, is evidently of great use in medicine: it must assist us in accounting for several phænomena that occur in various disorders that are utterly inexplicable by other means, and of consequence must lead to a more successful practice. In nervous disorders, and in fevers of the putrid, malignant kind, for instance,

stance, we find the Heart so extraordinarily weakened, that it is in many instances dangerous to subject the patient to an erect posture, even though it be but for a very little time *; syncopes, and even fatal deliquia and comatose affections have been the consequence. In scurvy too, where the whole system is become very lax and tender, and has lost much of its tonic and vital elasticity, the same phenomena have occurred †. In those cases, the necessity of the horizontal, or at least the recumbent posture, is manifest, as it is obvious how much more force is requisite to throw the blood up into the head in an erect than in an horizontal position.

It is probable, if the extreme weakness and slow recovery of some women, particularly such as are of a delicate constitution, after a hard labour, depend very often upon the weakness of the heart, occasioned by the force it sustained during the throws of labour; in these cases, though rest is among the first methods of recovery, yet I think I have observed the use of the quinquina to be attended with good success.

To conclude, it is probable that cases of this kind occur much oftener than we are aware of, as doubtless the dissection of morbid bodies, were that but more frequently allowed of, would teach us: there is room to think that this is the case, though not in the degree of the instance before us, in almost all diseases arising from a weak and lax fibre. Cheselden tells us in his Anatomy, that in persons "that died of a dropsy, he always observed the Heart large, its fibres lax, and the vessels about it immoderately distended."

ARISTOTLE ‡ expressly says, that timid people, and those of cold constitutions, have large Hearts; on the contrary,

* Vide Hoffman. Opera, tom. ii. p. 72. tom. vi. p. 169. de Situ erecto in Morbis periculosis valde noxio.

† Engalen. de Scorbuto, p. 226 & passim.

‡ Lib. iii. de Partibus Animal. cap. 4.

that the bold, and those of a warm temperament, have small ones : nor does this opinion of that excellent philosopher seem ill founded, as women, children, and weakly men, from whom much courage is not looked for, are lax-fibred, and consequently more subject to an enlargement of this organ, than those of the human race who are robust and tense-fibred, from whom a manly exertion of courage is more to be expected.

N° LXXXII.

On different Kinds of the false Aneurism. By Mr. Foubert.

[From the Memoirs of the Royal Academy of Surgery at Paris.]

THE division of the Aneurism into true and false is established and admitted by all authors who have treated on this subject ; but they have not distinguished two kinds of the false Aneurism which may happen, especially at the arm, on occasion of bleeding ; the one primitive and the other subsequent.

I CALL that a false primitive Aneurism which, at the instant of the bleeding, forms an extravasation of blood along the cord of the vessels in the cellular texture, which is sometimes extended from the aperture of the artery by ascending along the arm as far as under the axilla, and requires speedy succour.

WE know that the cellulæ adiposæ, distended by the extravasated blood, often cause a considerable swelling at the part, accompanied with an œdema, from the obstruction which the blood meets with to its reflux in consequence of the compression of the vessels ; sometimes these cellulæ, distended separately,

rately, form particular tumors; the cedematous swelling makes it difficult to extend the fore arm, and, if I may use the expression, renders the artery deeper: in fine, there sometimes happens an inflammation at the skin, which threatens a gangrene; the consequence of a bandage ill made, and an irregular compression.

I CALL that a false subsequent Aneurism which is not formed till some days after the bleeding, because, though the compression has been well made at the instant of the accident, yet either for want of continuing it sufficiently, or from not taking the necessary precautions for maintaining its effects, the coagulum, which was formed in the wound of the artery, had slipped out, and the blood extravasated into the capsula which surrounds the ends of the vessels, by raising the aponeurosis of the biceps muscle, with the parts contiguous to it.

THIS false Aneurism may appear with the signs of the true one, or that made by dilatation; though it be formed by the blood out of the artery; it forms at first a small tumor, which increases by little and little, and acquires more or less bulk, according to the time of its formation and the quantity of blood extravasated: this tumor is round and circumscribed, without any change in the colour of the skin; it is liable to an almost total diminution when compressed.

THIS Aneurism is generally the consequence of a bleeding at the arm, and, as I conceive, is formed in this manner: when the blood of the artery has been stopped, the wound on which a sufficient compression has been made re-unites; the skin, the fat, the aponeurosis of the biceps muscle, and the capsula of the artery, are cicatrized; but the incision of the body of the artery is not immediately re-united, and leaves a round aperture, wherein a coagulum is formed. If the compression is continued a sufficient length of time to procure a perfect induration of this coagulum, the disorder will be radically

cured; but if the arm be suffered to move before the coagulum has acquired a sufficient solidity for cementing the adhesion of the capsula and aponeurosis, the coagulum will slip out from the aperture, the blood will insinuate round and remove it from the place it possessed; the repeated impulses of the artery will separate the parts near its aperture, and this will give room to the aneurismal tumor, which, when compressed, seems to be dissipated, because the fluid blood repasses into the artery: this tumor, by increasing in bulk and growing older, forms bloody strata or polypuses, which are considerably indurated, especially those which touch the most prominent part of the tumor.

THIS theory is confirmed by a great number of facts, which the operations I have had an opportunity of performing in Aneurisms of this kind have furnished me with, and by the dissection of those who have been cured of the like disorders by means of compression; in these dissections, on opening the artery in the hinder part at the place affected, I have found a round hole exactly stopped by a very solid coagulum of blood, and opening with care the exterior surface of the artery, I discovered at the place of the tumor a stopper formed by the coagulum, so that the artery, the capsula, and the aponeurosis adhered together by a common cicatrix. In the operations which I have performed, I have found a cyst or bag, more or less solid, according to the antiquity of the disorder; this bag seemed to be formed externally by aponeurosis, and internally by a collection of several bloody strata, whose exterior parts were of a firmer consistence than the interior, which, no doubt, was owing to their substance having been exposed a longer time to the impulsive action of the blood and the resistance of the circumjacent parts. After having evacuated the whole fluid which was found in this kind of cyst, I have observed that the arterial tube was separated in the whole extent of the tumor, and that there was a round hole, through which the blood had discharged itself, which I easily

easily discovered on loosening the tourniquet to give vent to a stream of blood that flowed from it.

SEVERAL years ago I communicated to the Academy some facts on which the doctrine here delivered is founded; and it has been since confirmed by new observations: here follows the method of cure which I made use of with regard to the different states of the disorder.

WHEN the tumor is small and just commenced, I cure it by a methodical compression; but if it be of long standing, and we would make use of compression, the skin is ulcerated, the bag may burst open, and the patient perish without being in a condition of meeting with any succour. The operation, therefore, is absolutely necessary, though not so urgent as in the false primitive Aneurism; we may wait till it has acquired a certain bulk, and the operation will become easier.

IT is not easy to know, whether a trunk has been opened, or only a branch; this can only be discovered on the inspection of the artery when we have laid the tumor open, and removed the coagulated blood: if it be very large, it may be presumed that it is the trunk; and it is to be wished that no ligature be put on it; the patient may be cured by an exact and regular compression, whose principal point of rest is on the aperture of the artery; of this I have proofs. I have succeeded with chewed paper and lint; and we are now acquainted with the virtues of agaric, whether it be of oak or beech*.

WITH regard to the operation, the patient being seated on a stool of a convenient height, and having presented his arm,

* It has been found by experience that agaric of beech is full as good as that of oak, and that the author of this remedy has made use of it in his experiments. It is of some consequence to be acquainted with this particular, because that of the oak is very rare, and that of the beech very common: it is of this latter that touch-wood is made.

which must be held by assistance, I apply the tourniquet in the same manner as for amputation; I open the teguments according to the ordinary practice, and after having opened the tumor, I cut into its whole extent by piercing as far as the fluid blood; in the same manner as if I had opened an abscess: I remove, as much as possible, the blood and coagulums, which form a kind of cyst, and having by these means discovered the artery, and found its aperture, in case it is a branch, I pass under the artery a crooked needle, very sharp-pointed and sharp-edged, so that it may penetrate as it enters by the side of this vessel, which regards the internal condyle of the humerus, and taking care also that the thread may comprehend a certain quantity of the parts, together with the artery, in order to render the ligature more firm. I have remarked, that by this method the nerve is more certainly avoided, which, without this precaution, might be compressed in the ligature. One sole ligature placed above, at some lines distance from the aperture made at the artery, may suffice, and it has often succeeded with me; however, I advise the making of a second ligature below: the threads were stopped in the usual manner.

I FILL the wound with dry lint, which I sustain with long compresses and a convenient bandage, observing not to make it too tight, for fear it should be an obstacle to the distribution of the fluids: I carefully observe what passes at the fore arm, which must be covered with compresses dipped in warm brandy, and often renewed, in order to preserve the heat. The apparatus should not be touched till forty-eight hours after the operation; we wait for the fall of the lint, which generally happens in ten or twelve days, and that of the threads, which is a little later: when the ligatures are fallen off, the wound is filled with soft dossils rolled in powder of colophonia, and the cure is commonly obtained in a very short space of time.

THE theory of this kind of false Aneurism, the subject of the present memoir, is confirmed by the following observations :

Obs. I. In 1740, I performed an operation of this kind on a young man whose arm was so œdematous and so much swelled with the extravasated blood, that I could not extend the fore arm sufficiently for operating; the coagulated blood possessed several cavities in the cellulæ adiposæ, and it was difficult to discover the artery: I was obliged to slacken the tourniquet several times to see the blood discharge, and to find out the place of the disorder. In making the dilatation I took care not to cut the collateral branches of the artery, nor to prick it in another place: the blood was stopped by the ligatures. Seven or eight days after, in dressing the patient, there came on a cough, which made the upper ligature start, and the blood flowed out in great abundance; as I had still kept on the tourniquet, I was less embarrassed by this accident; I made use of a needle, and happily stopped the blood: the patient was perfectly cured in six weeks.

Obs. II. In 1732, I was sent for to see a man who had been bled in the right arm two months before: the surgeon having perceived that he had opened the artery, had stopped the blood, and taken all possible precautions that this accident might have no disagreeable consequence; on the fourth day he was obliged to take off the apparatus, because the bandage had slackened; he found, in the place where the puncture had been made, a small aneurismal tumor, as large and round as a filberd; he applied a fresh bandage, which was left on for ten days: having examined the arm, he discovered no more tumor in it, and as he thought the patient intirely cured, he permitted him to take his ordinary exercise; but it was not long before he had cause to repent of this; for, on the patient's making an effort the tumor appeared again, at first of the bigness of a small walnut, and by degrees as large as a pullet's egg. This was the state of the disorder when I was

con-

consulted: the tumor almost intirely disappeared on being compressed; there was perceived in it a pulsation like that of the true Aneurism, without any change in the colour of the skin. I performed the operation in the presence of Mess. Malaval and Bagieu. The artery having been discovered, I slackened the tourniquet, to shew them the puncture made in it, and without dilating it applied two ligatures, in the manner I have explained; after having covered the aperture with a small compress, which was held fast in the ligatures, I filled the wound with dry lint, and applied the proper apparatus; I had taken the precaution to leave the tourniquet on the arm without being screwed: two days after I only changed the compresses, and this with precaution; but no pulse was as yet perceived; on the fourth and fifth days the natural heat was established, and the pulse began to discover itself; in fine, on the fourteenth day the ligatures fell off with the lint, and the wound was incarnated. The patient was cured in thirty days without any difficulty remaining in the motion of his arm.

OBS. III. In 1733, a man about twenty-five or thirty years old came to consult me about an aneurismal tumor at the right arm, as large as a pullet's egg, which had been formed in four or five months in consequence of a bleeding; this tumor had the same character with that of the preceding patient: I advised him to the operation, and he was cured in the same manner.

OBS. IV. In 1737, a young man was bled in the arm; there came on a false aneurismal tumor, of the same kind as the preceding; I made the operation, which was attended with the same success as that in the foregoing observations; and he was cured in twenty-three or twenty-four days.

At the hospital of La Charité I have several times performed this operation for Aneurisms of the same kind, and have cured them all in a month or five weeks at farthest.

HERE follow two other very interesting observations; the one of a subsequent Aneurism, the other of a primitive one; both were cured without operation.

Obs. V. In 1732, I was sent for to a place six leagues from Paris, to a man there above seventy years of age, who had been let blood the preceding evening by a country surgeon, who had opened the artery: this surgeon had stopped the blood with compresses, a leaden plate, and a very tight bandage; I did no more at that time than loosen the bandage, as the fore arm would have been otherwise seized with a mortification. I conducted the patient to Paris, and took off the apparatus; as the arm had suffered a great deal from the first bandage, I thought it sufficient to apply another which should make a less violent compression; seven or eight days after I examined the wound occasioned by the puncture, and perceived a small Aneurism, which formed a tumor as large as a filberd; I then made a more exact compression with chewed paper, graduated compresses, a bandage, and a machine different from that called ponton, as it only presses on the tumor and the elbow, leaving at liberty the vessels through which the blood returns: no swelling followed, and the pulse was soon perceived. Eight days after I took off the apparatus, found no more tumor, and repeated the same application; at the end of forty days the patient seemed to me to be cured, and I permitted him a moderate exercise.

SOME months after he was seized with an apoplexy, and died; being informed of it, I requested the liberty of examining the arm, which was granted me: I took out the cord of the vessels four fingers, both above and below the place where the disorder had been; this piece I carried to the Academy in a session wherein M. de la Peyronie presided; he appointed Mess. Petit, the father and son, to join with me in the examination of it, which was made as follows: the artery was disengaged from the other vessels, and we managed with

with caution a small hard substance which was perceived in the place of the cicatrix; it appeared to be formed by a very intimate cohesion of the aponeurosis of the biceps muscle, the capsulæ of the vessels, and the wound of the artery; for all these adhered together. The artery having been opened at the hinder part, we found at the place of the puncture a round hole, which answered the small hard substance, and was stopped by a very solid coagulum of blood; at the outward part of this aperture it formed a small stopple, like the head of a nail, which made the union and cicatrix of the parts. It is probable that the cure of these disorders is always made in this manner, and that compression continued for a long time may cure these wounds.

Obs. VI. In 1748, I saw a man above seventy-five years of age, who had been bled on account of a retention of urine, for which I was sent for: he informed me that his surgeon had been twice with him to stop the blood; that he afterwards felt a very sharp pain in the arm, and thinking it was owing to the bandage being too tight, he desired me to slacken it. Having examined this arm, I found it much swelled from the place of the puncture as far as under the axilla; the fore arm was grown livid from the violent pressure of the ligature. It was no hard matter for me to comprehend that the artery had been pricked: I sent for the surgeon, who agreed with me. I took off the ligature, and removed every thing he had applied to the puncture; I held my thumb firm on the wound to remove the coagulated blood which had interposed between the aperture of the artery and that of the skin; and in the depression which I made I put a stopper of chewed paper, which was squeezed out and pretty solid; it was secured by small graduated compresses and some turns of bandage moderately tight: I made the surgeon sustain this apparatus with his fingers, whilst I went for the machine adapted to this kind of compression; the description of which I shall give at the end of this memoir.

BUT

BUT there still remained a very considerable extravasation of blood from the wound to the axilla; this made a round protuberance along the cord of the vessels, which stretched the skin very much. I wrapped the arm, and even the fore arm, in compresses dipped in brandy, wherein were dissolved camphire and sal ammoniac; these compresses were often moistened: it was a long time before any pulse was perceived. Eight or ten days after I took off the apparatus, in order to renew it intirely, and was much pleased to find things in so favourable a situation; no tumor had been formed between the wound of the artery and that of the skin; there was only a sort of contusion at the circumference of the puncture.

I TOOK care in my apparatus to make a point of support something softer, which was sufficient for continuing the cure; but the arm remained always swelled; and though the skin was less tense, the blood, extravasated along the cord of the vessels, had liquefied, tinged the skin red, and prepared an abscess, which it would be necessary to open. In effect, about three weeks after the accident I made an incision, and extracted from it a quantity of black blood of an ill smell; but every thing appeared well on the side of the puncture: the wound was deterged and disposed to cicatrization, when new symptoms came on with regard to the retention of urine, and the patient died, the cicatrization not being yet perfect.

I DESIRED the surgeon who attended him to take out the cord of the vessels; I examined what had passed at the puncture of the artery, and found that the trunk had been opened some lines above its divisions; that the wound was round, and full of coagulated blood, which had formed an hard substance of such solidity that a cure might have been hoped for, if there had been no other disorder.

THERE now only remains to give the description of the machine of iron which I employ for the compression, mention

whereof is made in this memoir. It is composed of a circle of iron, somewhat oval; on one side there is a plate furnished with a small cushion, and on the other an hole pierced in its thickness, through which passes a pyramid with a screw, which carries at its extremity another small cushion of more or less size and breadth, according to the greatness of the wound and bulk of the part, being intended to compress the place of the aperture of the artery. It may be easily conceived that the bottom of this bandage re-unites the advantages of the compressive machine of Sculter and the ponton of the Abbé Bourdelot. The greatest diameter of this oval, towards the sides of the limb which must not be compressed, is very useful for the liberty of the circulation: I have caused three of these bandages to be made of different sizes, one for the arm, the other for the leg, and the third for the thigh; this last is composed of different pieces, which are joined by two screws in the place of the separation, in order to stop them more commodiously, and give them more or less aperture according to the state and bulk of the thigh.

N° LXXXIII.

Of the Dislocation of the Bones of the Tarsus, the Metatarsus, and the Toes. By M. Belloste.

THE Tarsus, Metatarsus, and the Toes, may be dislocated several ways, as well as the bones of the hand: the bones of the Tarsus may be dislocated to the inside and the outside, but not sideways, by reason that they rest one upon another, and have a joint-stay. The three bones of the Metatarsus suffer luxation only to the outside or the inside. The bone that sustains the great Toe may be dislocated forwards, backwards, and sideways; and the sustainer of the little Toe is exposed to the same hazard: the other bones of the Toes may be dislocated every way, whether forwards, backwards, inwards, or outwards,

IN order to reduce these bones, let the patient be held upright in a man's arms, so that the sole of the foot may rest firm upon the floor, and let the surgeon push the eminence of the bone from that side on which they lie in their preternatural state. If the bones of the Tarsus are slipped out to the inside, you must take a rolling-pin, or a piece of round wood, and make the patient rest the sole of his foot upon it as firmly as ever he can, and move his foot several times on the resting point.

THIS sort of accidents commonly perplex us more than fractures, upon the account that we cannot limit the time of the cure: upon this occasion we use roses, pomegranate-flowers, and linseed, boiled with harsh wine; after the decoction is taken off the fire, we add to it oil of roses, and with the liquor of this decoction, very hot, we rub the patient's foot for a considerable space of time; we likewise cover the compresses with the substance of these ingredients thus boiled, and so apply it very hot to the foot. The bandage is the fandal.

N° LXXXIV.

Foreign Medical Literary Intelligence.

L E I P S I C.

JOhann. Ulrich Bilguer, &c. Anweisung zur, &c. or, Instructions for the Practice of Surgery in the Hospitals of Armies. By Mr. Bilguer, doctor in philosophy, physic, and surgery, surgeon general to the army of the king of Prussia, member of the academy of the Curios. Natur. and of the societies of Gottingen and Mayence. Sold at Glogau and Leipzig by Gunther, 1763, large 8vo.

FLORENCE, August 1763.

II. COLLEZIONE Istoria di Casi Chirurgici metodicamente disposti, e con Noti illustrati da Giuseppe Cavallini di Copolini, alunno nel regio spedale di S. Maria Nuovo di Firenze. Tom. I. part i. sopra i tumori infiammatori d'ispezione chirurgica. In Firenze, 1762, appresso Andrea Bonducci, p. 248, in 4to. Or, An historical Collection of surgical Cases, illustrated with Notes. By Joseph Cavallini di Copolini, who was educated in the royal hospital of Sta. Maria Nuovo in Florence. Vol. I. part i. on inflammatory tumors by surgical inspection. Florence, 1762, printed for Andrea Bonducci, p. 248, in 4to.

THIS is a work of which the continuation is promised to the Public: M. Cavallini has introduced this work with a prefatory dissertation upon the stagnation of the fluids or juices of the human body. This volume contains one hundred and forty-eight surgical observations upon inflammatory tumors.

IN the month of August 1762, a contribution was raised by some charitable people in this city, under the sanction of public authority, in favour of twenty poor children who are to be inoculated with the small-pox in the hospital of St. Matteo, with a view of trying the success of this practice.

V I E N N A.

[From the Journal des Sçavans.]

III. TRAITE de l'Utilité de la Cigue dans la Chirurgie; par M. Leber, docteur & professeur en chirurgie, &c. or, A Dissertation on the Use of the Cicuta in Surgery. By Dr. Leber, professor of surgery at Vienna. Published by J. T. Tratner, 1762, in large 8vo.

THIS

THIS work is composed in the German language, and dedicated to Dr. Storck, the author of two well-known treatises on the effects of the *Cicuta* in various disorders.

DR. Leber asserts, that he has found very great benefit from the application of this plant in scirrhus and cancerous cases, and that it has proved serviceable in fistulas, ulcers, rheumatisms, and some other disorders.

YET, after all that has been said from Vienna in favour of the *Cicuta* in desperate cases, our good wishes towards mankind make us sorry to confess that some diffidence, with respect to the veracity of these accounts, is rendered excusable by the relations we have had of the consequences attending its use in other places. In England it is well known that it has very often, even when carefully administered, done mischief, very seldom relieved, and scarcely ever performed a cure.

DR. Brawn of Turin assures us by a letter just arrived, that it has been tried this last summer in that city in cancerous and other cases; but that it has not once appeared to produce the desired effect.

THE physicians, therefore, in that part conclude, that Dr. Storck has been too liberal of the good and almost specific qualities which he has attributed to this plant.

THE medical people in Paris and other parts of France inform us that they, in full affiance on the good faith and veracity of Dr. Storck, have given to this vegetable the fairest trials in all such cases for which he has so strenuously recommended it, but without ever having been so fortunate as he professes he has been with it; there seems, therefore, something in this affair which is not perfectly elucidated to the world by the physicians of Vienna, and which we should be glad to see satisfactorily explained. We must, indeed, candidly

didly confess, that the trials seem to have been very fair, as they have been made in three different kingdoms, and in different latitudes with respect to situation: so that we cannot suppose but that the plant must have been of as much efficacy in some of them as it is at Vienna: nay, the extract has been sent to us by Dr. Storck and the Baron Van Swieten from Vienna, and yet it has not, on trial in England, proved in any degree so successful as their accounts would persuade us it has proved in Germany.

A DECOCTION of the Cicuta being injected into a fistulous ulcer has produced the same effects as if the person had been poisoned with it; therefore it ought to be administered internally with great circumspection. From all the trials that have been made of it, the best method of using this medicine seems to be that of applying it externally by way of cataplasm, &c. The Greeks, when Athens was just upon the turn of its meridian point, condemned their state malefactors to drink a bowl of the juice of Cicuta; this was the judgment against the good Socrates: probably some hint derived from the experiments made upon it in this way, might give rise to its use as a medicine; for in the time of Persius we find the Cicuta was used internally as a medicine for disorders of the breast, which from his expression appear to have been cancers tending to ulceration: his words are,

—— Calido sub pectore macula bilis
Intumuit quam non extinxerit urna Cicuta.

SAT. V. l. 144.

P A R I S.

IV. REFLEXIONS sur les Constitutions Epidemiques d'Hippocrate; or, Considerations drawn from the Treatise of Hippocrates upon Epidemic Constitutions: Part I. Translated from a MS Copy sent to the president of the faculty of physic in Paris, &c.

AT

AT Thasis *, towards the autumnal equinox, and about the time of the occultation of the pleiades, it was much and almost continual rain; the rains were mild and the wind southward: in winter the same winds blew; those from the north seldom. The season was remarkably dry, and the whole winter was rather like spring, for the mildness of the weather; during the whole course of which it was observed that the wind continued at south, with a very sensible cold, and scarcely any rain: the sky for the greatest part of summer was cloudy and very sultry; no rain fell. The Etesian winds † seldom blew; when they did, it was by gusts, and very feebly: thus perpetual south winds and a great drought characterise this constitution.

BURNING fevers began to appear in the very beginning of the spring, which was introduced by the wind at north, which was a violent contrast, though but of short continuance to the general constitution of the preceding year. Few persons were attacked by those fevers; they were benign, rarely accompanied with hæmorrhages, and never proved mortal: a small number of the sick were attacked with parotid swellings, some on one side only, and some on both sides; the most of them had no fever; some few had febrile heats; those tumors were all dispersed, and went away without any bad consequence, or ever coming to suppuration; they were soft, elevated, and broad without inflammation; perfectly indolent, and disappeared insensibly. These tumors were the most frequent amongst young men, particularly the robust and athletic; they seldom happened to young women: the major part of these patients had troublesome dry coughs, afterwards followed by catarrhus defluxions; some of them had the right, some the left, and others had each testicle tumefied, painful, and in-

* One of the Greek islands, where Hippocrates lived some time.

† Etesian winds are those winds which in Greece commonly blow in autumn.

flamed;

flamed; some with, and some without a fever, but always excessively painful, otherwise these disorders disappeared without the help of art. But at the beginning of summer, and during the whole season, even until the end of autumn, many of those who were afflicted with consumptions, and greatly reduced, were confined to their beds; and at this time these disorders made a very sensible progress on all that were attacked, and very few of those who had any phthisical tendency now escaped; the numbers that died were considerable: the chief part of those afflicted with consumptive dispositions were carried off; and of those who were reduced to keep their beds, scarcely any who came under my care escaped speedy death. The disorder was more acute, and the catastrophe more immediate than is common in these cases, whilst at the same time other disorders attended with fever, even those of the longest continuance, were slight and benign: we shall give an account of them below. In a word, of all the disorders attending the constitutional temperaments of this year, the phthisis was the most affecting object of consideration, and indeed the only disorder which the patient did not survive.

THE access of this phthisis was observed to be generally attended with horrors, the fever accompanying it was continued, acute, and without any perfect intermissions; it had the character of that species of fever called by the Greeks *Hemerritè*: if its accession was moderate, it returned the next day with redoubled violence, and the disorder grew more acute. The sweats were continual and partial; the extremities were very cold, and did not recover their due heat without much difficulty: the excrements were bilious, small in quantity, fluid, acrimonious, and frequent; the urine was limpid, discoloured, unconcocted, and little in quantity, or charged with a small deposition, which was ill-complexioned, crude, and unseasonable. The cough was short and frequent; the matter discharged

discharged by it was very little, and expectorated with difficulty ; when the cough was more violent, it was never accompanied with a discharge of well-concocted matter, but always crude to the last stage of the disorder. Amongst these a great part of the patients were from its first attack to the end of the malady afflicted with sore throats, attended with hoarseness and inflammations, from their being subject to defluxions of a small, subtil, acrid humour. The consumption was rapid in its progress, and the patients grew visibly worse every moment, having an universal and continual disgust to foods, though not accompanied with thirst. In short, they became delirious at the approach of death. Such was the phthisis of the constitution of this year.

DURING the summer and autumn small continued fevers were very frequent ; these disorders were long and tedious ; but in other respects attended with no dangerous symptoms : many of these patients had an almost perpetual flux, but not very troublesome, and, indeed, without any inconvenient circumstance. The urine was commonly of a good appearance, rather limpid and thin, depositing some sediment ; the cough was moderate, expectoration easy, and no nausea affected the patients : they took their foods willingly and with the desired effect. In short, these fevers were very different from those attending the superindicated phthisis. The horror was usually succeeded by small sweats. Its return was vague and uncertain ; they never came to a regular intermission, and followed pretty nearly the periods and progress of tertian fevers. The shortest duration of these fevers was twenty, but they most commonly continued for forty days : in many of them no judgment could be pronounced how they would terminate, until the twenty-fourth day. Sometimes they did not keep this order, but were irregular, and had no perceptible crisis that we could judge of. The chief part of this latter class of pa-

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tients were subject to sudden relapses, in which the same order of critical days and periods was observed, as that we have just mentioned. These fevers were sometimes prolonged even until the winter season was pretty far advanced. But of all the disorders attending the constitution of this year the phthisis alone proved fatal; those who had other complaints always recovered.



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